

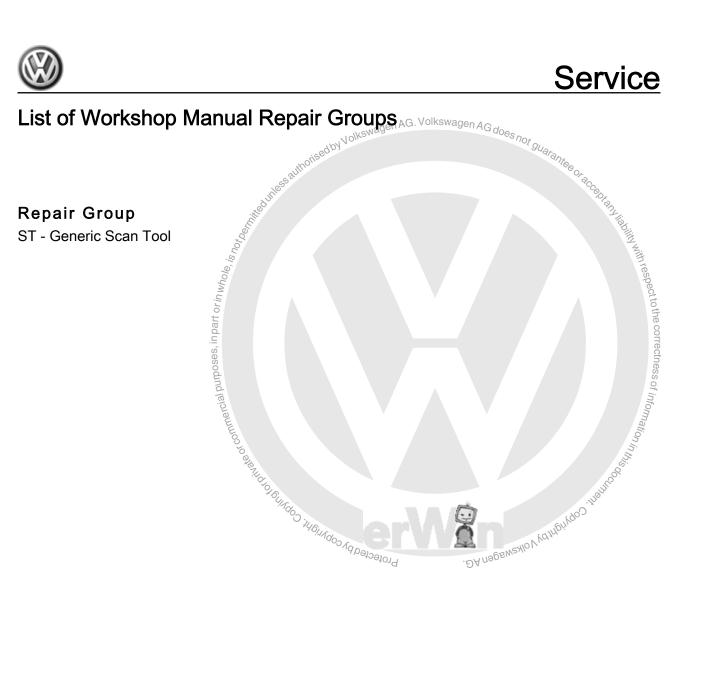
Repair Manual Jetta/Beetle 2013 ➤

Generic Scan Tool									
Engine ID	CPP A								

Edition 12.2017







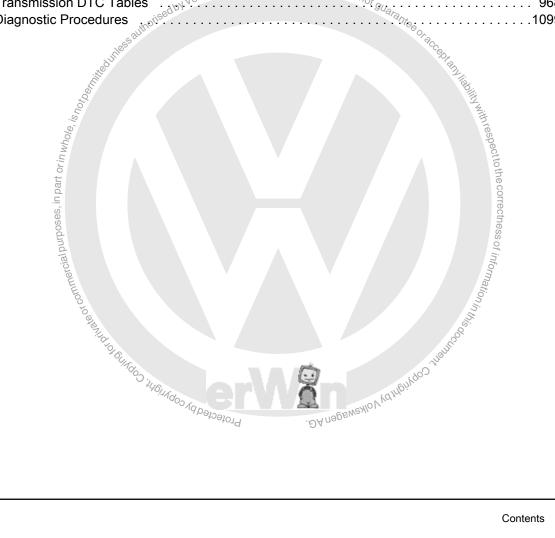
Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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ST – Generic Scan Tool

1 General Information

(Edition 12.2017)

Included in the contents of this Generic Scan Tool (GST) manual is a summary table of the vehicle specific OBD II Emission Related DTCs. The DTC table contains DTC Malfunction Criteria, Threshold Values, Secondary Parameters, Enabling Conditions, Monitoring Time Length, Frequency of Checks, and MIL Illumination information which can be used to accurately monitor and diagnose emissions related faults and perform functions required to run Modes 01 through 0A (if applicable) with a hand held scan tool.

This manual also contains the step by step procedures to accurately diagnose and repair a component or system once a DTC has been set. References to repair procedures and wiring diagrams can be found within the diagnostic test procedures.

- ♦ ⇒ "1.1 Safety Precautions", page 2
- ♦ ⇒ "1.2 Clean Working Conditions", page 3



1.1 Safety Precautions

Check for Technical Bulletins that may supersede any information included in this manual.



WARNING

Failure to follow these instructions may result in personal injury or possible death.

Check the Technical Bulletins for information, cautions and warnings that may supersede or supplement any information included in this manual.

When performing the drive cycle operation, pay strict attention to driving conditions and observe and obey all posted speed limits.

Test equipment must always be secured to the rear seat and operated by a second person. If test and measuring equipment is operated from the passenger seat, the person seated could be injured in the event of an accident involving deployment of the passenger-side airbag.

The fuel system is under pressure! Before opening the fuel system, place rags around the connection area. Then release pressure by carefully loosening the connection.

The engine section of the fuel system, after the high pressure pump, is under extremely high pressure! When working on engine or fuel injection system, fuel pressure must be relieved to residual pressure before opening high pressure components. Refer to the Service Manual for the proper procedure.

If the battery has not been disconnected, the fuel pump fuse must be removed before opening the fuel supply system as the fuel pump may be activated by the driver's door contact switch.

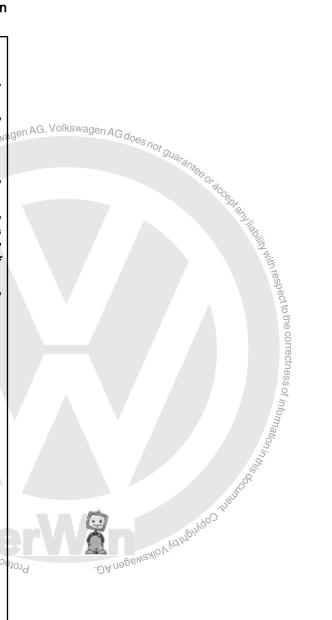
Testing of the EVAP and ORVR systems can result in the escape of explosive fuel vapor. Do not smoke while testing the EVAP system, and make sure the area you are working in is well ventilated.

Observe the following for all procedures, especially in the engine compartment due to lack of room:

- Route lines of all types (e.g. for fuel, hydraulic, EVAP canister system, coolant and refrigerant, brake fluid, vacuum) and electrical wiring so that the original path is followed.
- Watch for sufficient clearance to all moving or hot components.
- Do not touch or disconnect the Ignition Coils, ignition wires, connecting parts or adapter cables when the ignition is on or the engine is running or turning at starting RPM.
- Only disconnect and reconnect wires for injection and ignition system, including test leads, when the ignition is turned off.

When removing and installing components from full or partially full fuel tanks, observe the following:

◆ The fuel tank must only be partially full. How much fuel can remain in the fuel tank may be read in the respective work description. Empty the fuel tank if necessary.



- Before starting work, switch on the exhaust extraction system and place an extraction between them. tem and place an extraction hose close to the installation opening of the fuel tank to extract escaping fuel fumes. If no exhaust extraction system is available, a radial fan (as long as motor is not in air flow) with a displacement greater than 15 m³/h can be used.
- Prevent fuel from contacting the skin. Wear fuel-resistant gloves!

When servicing the engine control module (ECM), it may be necessary to use a heat gun. The heat gun, shear bolts, and parts of the protective housing will become extremely hot. Use extreme caution when working with or handling these parts to avoid personal injury.

Observe operating instructions when working with a heat gun. To prevent damage (burning) to the wiring and harness connections, insulation and the electronic components, perform outlined work steps exactly!

The cooling system is under pressure. To avoid scalding, use caution when opening the cooling system and servicing cooling system components!



Caution

The battery must only be disconnected and connected with the ignition switched off. Otherwise, the engine control module (ECM) can be damaged.

The use of nails, paper clips, or another unauthorized materials to back-probe electrical harness connectors is strictly prohibited and may cause damage to the electrical harness connec-tors, terminal ends or to a component. Use only the manufacturers test lead kit or an equivalent aftermarket test lead kit for back-probing all electrical harness connectors.

Do not use sealants containing silicone. Particles of silicone drawn into the engine, will not be burnt in the engine and will damage the oxygen sensors.

Secure all hose connections with the correct hose clips (the same as original equipment).

If engine is to be cranked without starting, for example as part of a compression test, remove the fuses for the voltage supply of Ignition Coils and the fuel injector.

An electrostatic charge can lead to functional problems of electrical components of the engine, transmission and selector lever mechanism. Touch a grounded object, e.g. a water pipe or a hoist, before working on electrical components.

Do not make direct contact with electrical harness connector terminals.

Use only gold-plated terminals when servicing any component with gold-plated electrical harness connector terminals.

1.2 **Clean Working Conditions**

Even minor contaminations can lead to malfunctions in the fuel injection system. When working on the fuel supply/injection system, pay careful attention to the following rules of cleanliness:

Thoroughly clean all connections and the surrounding area before disconnecting.





- Place removed parts on a clean surface and cover. Use lintfree cloths.
- Carefully cover opened components or seal, if repairs are not performed immediately.
- When the system is open, do not work with compressed air.
 Do not move vehicle unless absolutely necessary.
- Install clean components: Remove the parts being replaced immediately prior to installation of the new parts. Do not use parts that have been stored unpacked (e.g. in tool boxes etc.).
- Electrical connectors that have been disconnected: Protect from dirt and moisture. Make sure connections are clean and dry when reconnecting.



2 **Description and Operation**

- ⇒ "2.1 On Board Diagnostic Systems", page 5
- ⇒ "2.2 Evaporative Emission System", page 5
- ⇒ "2.3 Electronic Throttle Control (ETC) System", page 7
- ⇒ "2.4 Electronic Power Control (EPC) Warning Lamp",
- ⇒ "2.5 Engine Control Module (ECM)", page 8
- ⇒ "2.6 Malfunction Indicator Lamp (MIL)", page 8
- ⇒ "2.7 Controller Area Network (CAN)", page 8
- ⇒ "2.8 Fuel Supply", page 9
- ⇒ "2.9 Ignition and Timing", page 10
- ⇒ "2.10 Variable Valve Tming", page 11
- ⇒ "2.11 Exhaust-Gas Recirculation (EGR) System" <u>page 11</u>
- ⇒ "2.12 Secondary Air Injection", page 11
- ⇒ "2.13 Exhaust Systems", page 11

2.1 On Board Diagnostic Systems

On Board Diagnostics, or OBD, is an automotive term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle owner or repair technician access to the status of the various vehicle sub-systems. Modern OBD implementations use a standardized digital communications port to provide real-time data in addition to a standardized series of Diagnostic Trouble Codes (DTCs) which allow one to rapidly identify and remedy malfunctions within the vehicle. Legislation mandates a vehicle equipped with OBD-II to light up the fault indicator lamp if its emissions exceed the prevailing limit due to system malfunc-

All cars built since January 1st, 1996 (MY 1996) are equipped OBD-II systems. Manufacturers started incorporating OBD-II in various models as early as 1994; however, some early OBD-II cars (MY 1994 and MY 1995) were not 100% compliant.

2.2 **Evaporative Emission System**

The evaporative emission system has been designed to minimize the release of hydrocarbons from the fuel system into the atmosphere. The evaporative emission system components all work together with the ECM to prevent fuel vapor from escaping and route it to the intake manifold to be burned during normal combustion.

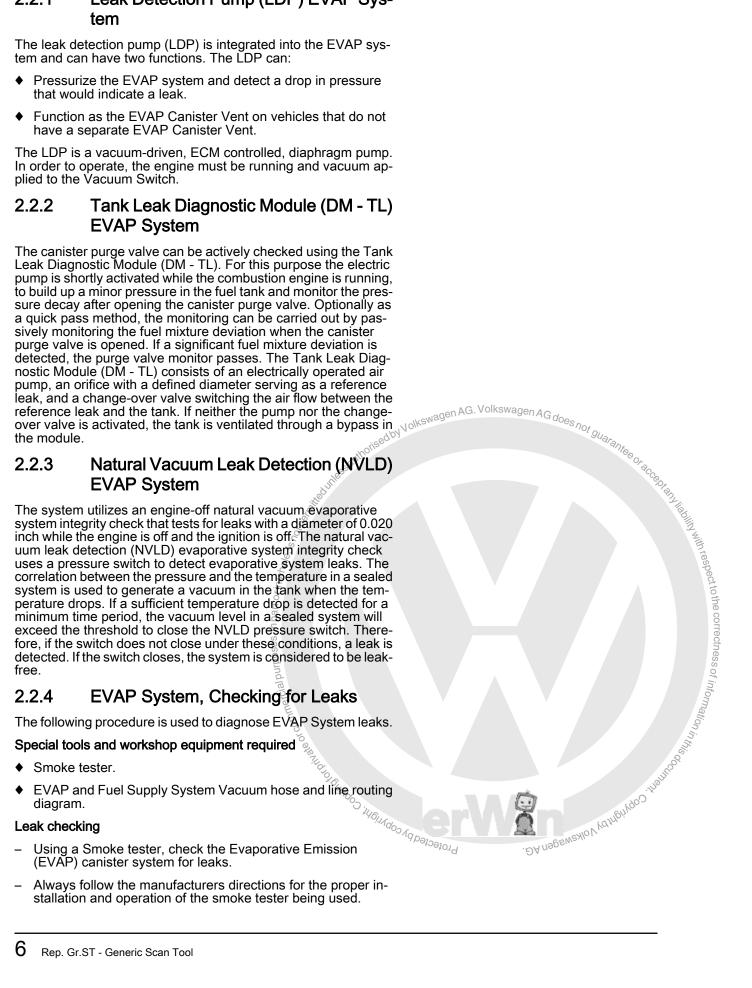
The leak detection system checks the integrity of the evaporative emission system by pressurizing the system.

- There are 3 different types of evaporative emission systems used. These systems are explained below.
- ⇒ "2.2.1 Leak Detection Pump (LDP) EVAP System", page 6
- ⇒ "2.2.2 Tank Leak Diagnostic Module (DM TL) EVAP System", page 6
- ⇒ "2.2.3 Natural Vacuum Leak Detection (NVLD) EVAP Sys-<u>tem", page 6</u>
- ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6



2.2.1 Leak Detection Pump (LDP) EVAP Sys-

The leak detection pump (LDP) is integrated into the EVAP sys-



If a leak is detected:

- Check the fuel filler cap seal for damage and for proper installation. Replace if necessary.
- Check all hose connections of the fuel supply system and replace or repair any leaking lines.
- Check all hose connections of the EVAP system and replace or repair any leaking lines.
- Check that the seal under the locking flange is properly tightened on the fuel tank.
- Secure all hose connections using appropriate fittings for the model type.
- Replace seals and gaskets when performing repair work.
- Repair or replace any damaged component.

If no leaks are found in the EVAP system:

- Erase the DTC memory if a DTC was set. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
- Perform a road test to verify repair.

If a DTC was set and does not return:

Diagnosis complete. Generate readiness code. Refer to ⇒ "3.2 Readiness Code", page 14.

If the same DTC does return and no leaks are found in the EVAP system:

- Check for any related TSB's.
- Perform the diagnostic test procedure for the suspected component.

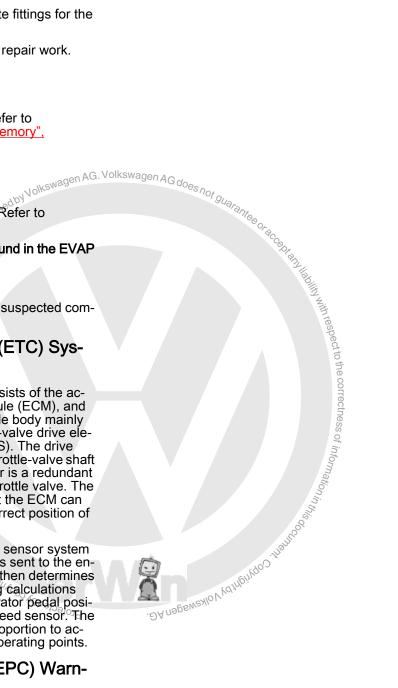
2.3 Electronic Throttle Control (ETC) System

The electronic throttle control (ETC) system consists of the accelerator-pedal module, the engine control module (ECM), and the electronic throttle body. The electronic throttle body mainly consists of the throttle valve, the electric throttle-valve drive element, and the throttle-valve position sensor (TPS). The drive element is a DC servomotor, which acts on the throttle-valve shaft via a gear unit. The throttle-valve position sensor is a redundant sensor system that detects the position of the throttle valve. The sensors have opposite resistance curves so that the ECM can always cross check the signals to ensure the correct position of the throttle valve is always known.

The driver command is detected by a redundant sensor system in the accelerator-pedal module, and the signal is sent to the engine control module. The engine control module then determines the required throttle-valve position by performing calculations from data measured by sensors such as accelerator pedal position sensor, engine speed sensor and vehicle speed sensor. The actual throttle opening can be more or less in proportion to accelerator pedal position given different engine operating points.

2.4 Electronic Power Control (EPC) Warning Lamp

When the ignition is switched on, the engine control module (ECM) checks the electronic throttle control system for static system integrity (e.g. circuit integrity, communications, etc); the electronic power control (EPC) warning light is turned on via the Instrument Cluster during this process. Shortly after engine start,





the EPC warning light is turned off if no malfunction in the electronic throttle control system is detected. In the event of a malfunction while the engine is running, the ECM will activate the EPC warning light via the Instrument Cluster and at the same time, a Diagnostic Trouble Code (DTC) is stored in the ECM memory.

2.5 Engine Control Module (ECM)

The Engine Control Module (ECM) is a generic term for any embedded system that controls one or more of the electrical systems or subsystems in a vehicle. It controls a series of actuators on an internal combustion engine to ensure that driver commands (e.g. to accelerate) are translated into appropriate engine performance. It reads values from a multitude of sensors, interprets the data, and adjusts the engine actuators accordingly. The ECM also interacts with the transmission control module (TCM), ABS/traction/stability control module and other vehicle function related control systems.

ECM controlled systems and functions (performance and emission related) will be introduced in the following chapters. These include the OBD system, controller area network (CAN), throttle control module, fuel supply, ignition, variable valve timing, exhaust-gas recirculation, secondary air injection, exhaust system, and EVAP system.

2.6 Malfunction Indicator Lamp (MIL)

When the ignition is switched on, the Engine Control Module (ECM) performs checks on static system integrity (e.g. circuit integrity, communications, etc). The Malfunction Indicator Lamp (MIL) is switched on during this process via the Instrument Cluster. After engine starts, the ECM examines engine operation for potential malfunction(s) or failure(s) that can lead to increased emission values. If no malfunction is detected, the ECM switches off the MIL via the Instrument Cluster.

In the event of a malfunction during the operation of the engine, the ECM will activate the MIL via the instrument cluster and at the same time, a Diagnostic Trouble Code (DTC) is stored in the ECM memory. In OBD systems, the MIL can have up to three stages: steady, flashing and Stop Vehicle. A steady MIL indicates a minor fault (e.g. a failing oxygen sensor) whereas a flashing MIL indicates a more severe malfunction that could result in damage of engine or exhaust system components (e.g. the catalytic converter) if left uncorrected for an extended period. This would also indicate a severe fault. The three stages are 1. ON, then OFF; 2. ON steady; 3. flashing constantly. The 3rd stage indicates damage may occur and driver must stop.

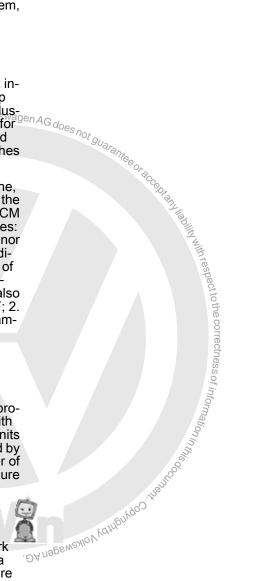
2.7 Controller Area Network (CAN)

Overview

The Controller Area Network (CAN) bus is a message-based protocol that allows control units and devices to communicate with each other using a shared network. With this system, control units of the various electronic systems are no longer interconnected by multiple separate cables. This does away with a large number of electrical connections and results in a reduced likelihood of failure of the device network.

Broadcast Communication

Each of the devices on the network has a CAN circuit and is therefore is considered "intelligent". All devices on the network see all transmitted messages. Each device can determine if a message is relevant or if it should be filtered out. This structure allows modifications to CAN networks with minimal impact. Addi-



tional non-transmitting nodes can be added without modification to the network.

Priority

Every message has an assigned priority. If two nodes try to send messages simultaneously, the one with the higher priority gets transmitted and the one with the lower priority gets postponed. This arbitration does not affect other messages and results in non-interrupted transmission of the highest priority message

2.8 Fuel Supply

Overview

The fuel supply system delivers fuel to an internal combustion engine. With carburetors being replaced by fuel injections systems in the late 1980s and 1990s, the most common types of fuel supply system currently in use are throttle body injection (single-point injection), multiport injection (MPI) and direct injection (DI).

Fuel injectors atomize fuel because high pressure is forcing the fuel through a small nozzle in the injector into the intake air stream or the combustion chamber. This process is often controlled by the ECM and is dependent on data received from other sources (e.g. mass air flow sensor, throttle position sensor, etc.) to determine the precise amount of fuel needed for any given operating condition. The primary advantages of fuel injection over carburetor are improved fuel economy, increased power output and reduced emissions. The following sections will discuss each fuel injection concept in detail.

Throttle Body Injection

Throttle body injection uses a single electrically controlled injector at the throttle body. The fuel is drawn by an electric fuel pump out of the fuel tank and flows through a paper filter into the fuel injector. Since injection happens at the same location as the carburetor, very little engine redesign (intake manifold, fuel line routing, etc.) is necessary. The cost saving of throttle body injection compared to other fuel injection methods encouraged vast adoption in the late 1980s and early 1990s.

Throttle body injection system also inherits many disadvantages of the carburetor. One of them being the inability to precisely control the amount of fuel supplied into each cylinder, and is unable to precisely control combustion and emissions. It also restricts the design of intake manifold as any sharp bends in the intake path will cause atomized fuel to accumulate on the outer wall of the intake path. Supplying moderate engine heat to the intake manifold is also necessary to ensure that the fuel stay vaporized. This results in a relatively high intake air temperature and compromises performance.

Multiport Injection (MPI)

Multiport injection (MPI) consists of an injector for each cylinder just upstream of the intake valve. The fuel pump delivers the fuel into a high-pressure line where it flows to the fuel rail and injectors. When activated by the ECM, each injector sprays fuel at the intake port of its corresponding cylinder – this allows individual cylinders to receive the right amount of fuel in a more precisely timed manner. Sequential fuel injection mode can be applied to activate each injector individually to improve engine response. Lowered fuel consumption and emissions are also achieved.

Sequential multiport injection is still the most common fuel injection system found on most economy cars thanks to its high efficiency, control simplicity and low manufacturing cost (compared to direct injection). However, to further improve drivability (performance) while reducing emissions and fuel consumption, direct injection becomes a superior alternative.

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Direct Injection

Injectors in directly injected (DI) engines are mounted on the cylinder head and fuel is injected directly into the engine's combustion chamber. In order to overcome the pressure in the combustion chamber during compression and power stroke, injectors often operate at a primary pressure as high as 3000 psi. At such extreme pressure level, no single fuel pump can supply the required pressure directly from the fuel tank to the injectors. Instead, a low-pressure and a high-pressure system are employed. The low-pressure system principally utilizes the same fuel systems and components for multiport injected engines. The high-pressure system consists of a high-pressure fuel pump driven directly by the camshaft, a fuel rail (high-pressure accumulator), a high-pressure sensor and, depending on the system, a pressure-control valve or a pressure limiter. The injectors are operated by the ECM to send a precise amount of fuel from the high-pressure rail directly into the combustion chamber.

The distinctive difference between direct injection and other injection methods is that direct injection offers the flexibility regarding when in the combustion cycle the fuel is added and how. MRI systems can only add fuel during induction; A DI system can add fuel whenever it needs to. For example, fuel can be added during induction to create a homogeneous charge then added again after ignition to enhance power delivery under full load conditions.

VW/Audi Fuel Stratified Injection (FSI)

The goal of a stratified-charge operation is to form an ignitable mixture near the spark plug at the instant of ignition. This means that instead of supplying the corresponding stoichiometric fuel quantity to the amount of air in the combustion chamber, the fuel interacts only with a portion of the air before it is conveyed to the spark plug. The rest of the fresh air surrounds the stratified charge allowing an ultra-lean condition with air-fuel ratio exceeding 50:1 in some instances. As less fuel is used to "burn" more air, stratified injection helps to further reduce fuel consumption when the engine is operating in low-load conditions (e.g. highway cruising). This is created by designing the combustion chamber so that a "swirling" effect of the air-fuel charge is caused.

2.9 | Ignition and Timing

Ignition %

A spark ignition (SI) engine requires a spark to initiate combustion in the combustion chamber. Voltage is supplied to the spark plug where the electricity will arc across a gap at a voltage as high as 100 kilovolts. The ECM determines the precise moment to fire each spark plug using ignition logic which is pre-programmed into the ECM as a function of engine speed and load. An optimally calibrated ignition system ensures consistent and reliable ignition under all conditions. Knock or misfire as a result of incorrect ignition can lead to destruction of engine components or damage of the catalytic converter.

Timing

Shifts in the moment of ignition (ignition timing) can result in increased emissions, decreased performance and fuel economy. Whereas more spark advance improves power and fuel economy, it also raises HC and NOx emissions. Excessive spark advance can cause engine knock which is potentially destructive to engines. If the ECM detects knock from a signal sent by a knock sensor, it will delay (retard) the timing of the spark. Excessive spark retard lowers power output and produces high exhaust temperatures, which can also harm the engine. Carefully designed ignition logic provides optimum timing that best balances performance, fuel economy and emissions.

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2.10 Variable Valve Timing

Engines equipped with variable valve timing provide the option of adjusting the phase of the camshaft with respect to the crankshaft. This allows the ECM to control the time at which the valves open or close, and therefore better assists engine "breathing" at various engine speeds. When engine speed increases, the duration of intake and exhaust stroke shortens so that less fresh air can be drawn into the combustion chamber and less exhaust gas can escape. In such a scenario, the ECM opens the intake valve before the exhaust gas has completely left the combustion chamber, and their considerable velocity assists in drawing in the fresh charge – this is referred to as "valve overlap".

In addition to valve timing, some engines also employ variable valve lift that switches to a more aggressive camshaft-lobe profile as engine speed increases. A more aggressive camshaft-lobe profile actuates valves more rapidly and lifts valves to a greater magnitude in comparison to a normal camshaft-lobe profile. This improves intake and exhaust flow rate, allowing engines to raise maximum operating speed and power output.

2.11 Exhaust-Gas Recirculation (EGR) System

Exhaust-Gas Recirculation (EGR) can be utilized to control the cylinder charge and therefore the combustion process. The exhaust gas that is recirculated to the intake manifold increases the proportion of inert gas in the fresh gas filling; this results in a reduction in the peak combustion temperature and, in turn, a drop in temperature-dependent NOx emission.

Exhaust-gas recirculation is made possible by a connection between the exhaust pipe and the intake manifold. Due to the pressure differential, the intake manifold can draw in exhaust gas via this connection. Together with the exhaust-gas recirculation valve, the ECM adjusts the opening cross-section and therefore controls the partial flow tapped from the main exhaust flow. A malfunction in exhaust-gas recirculation system can result in performance loss and increased emissions. In such a scenario, the Malfunction Indicator Lamp (MIL) lights up and a Diagnostic Trouble Code (DTC) is stored in the ECM memory.

2.12 Secondary Air Injection

Additionally injecting air into the exhaust pipe triggers an exothermic (release of heat) reaction. This leads to the combustion of HC and CO components that prevail mainly during the warm up phase. This oxidation process releases additional heat. Consequently, the exhaust gas becomes hotter, causing the catalytic converter to heat up at a faster rate. For spark-ignition engines, secondary-air injection is an effective means of reducing HC and CO emissions after starting the engine and to rapidly heat up the catalytic converter. This ensures that the conversion of NOx emissions commences earlier.

An electronically controlled valve operates the secondary-air valve (a one-way check valve). The ECM actuates the pump and the control valve, ensuring that secondary air can be injected at a defined point in time. The secondary air must also be injected as close to the outlet valve as possible in order to exploit the high temperatures to utilize the exothermic (release of heat) reaction effectively.

2.13 Exhaust Systems

Overview

There are three important functions of the exhaust system: to reduce the pollutants in exhaust gas, muffle engine combustion noise and to discharge exhaust gas at a convenient location on

the vehicle (often underneath the rear bumper). A passenger-car exhaust system consists of the following; exhaust manifold, exhaust treatment components, sound absorption components and the system of pipes connecting these components.

Exhaust Manifold

The manifold is an important component in the exhaust system. It routes the exhaust gas out of the cylinder outlet ports into the subsequent exhaust system. The geometry of the manifold (i.e. length and cross-section of the individual pipes) has an impact on the performance characteristics; the acoustic behavior of the exhaust system, and the exhaust temperature. In some cases, the manifold is insulated with an air gap to quickly reach high exhaust temperature and to shorten the time taken by the catalytic converter to reach its operating temperature.

Emission Control

The primary emission control component is the catalytic converter, which breaks down the gaseous pollutants in the exhaust gas (CO, HC and NOx). Catalytic converters are installed as close as possible to the engine so that they can quickly reach their operating temperature and therefore be effective in urban driving. It also bears a sound-absorbing function, especially to the higher frequency portion of the engine combustion noise.

Sound Absorption

Mufflers dampen or absorb the noise produced by engine combustion. In principle, they can be installed at any position in the exhaust system. However, they are mostly located in the middle and rear sections of the exhaust system. Depending on the number of cylinders and engine output, generally 1 to 3 mufflers are used in an exhaust system. In V-engines, the left and right cylinder banks are often run separately, each being fitted with its own catalytic converters and mufflers. Although the aim of mufflers is to reduce noise in compliance with legislations, they can also help to create the sound specific to the type of vehicle.



3 Diagnosis and Testing

- ♦ ⇒ "3.1 Preliminary Check", page 13
- ♦ 3.2 Readiness Code", page 14
- ◆ ⇒ "3.3 Diagnostic Modes 01 0A", page 16
- ◆ ⇒ "3.4 Engine DTC Tables", page 68
- ◆ ⇒ "3.5 Transmission DTC Tables", page 968
- ◆ ⇒ "3.6 Diagnostic Procedures", page 1099

3.1 Preliminary Check



Note

- ♦ Before performing any pin point test or component diagnosis, a Preliminary Check must be performed.
- ♦ Check for Technical Bulletins that may supersede any information included in the repair manual or GST Manual.
- ◆ For Electrical Testing: Refer to <u>⇒ page 13</u>.
- ◆ For Fuel System Mechanical Testing: Refer to <u>⇒ page 14</u>.
- ◆ For Oxygen Sensor Preliminary Tests: Refer to <u>⇒ page 14</u>.

Electrical Testing

Step	Procedure	Result / Action to Take
1	CONNECT: Scan Tool.	 YES: ◆ GO TO: Step 2 ⇒ page 13.
	IGNITION: ON.	
	CHECK: For stored or related	DTCs. GO TO: Step 3 ⇒ page 13.
	– Were any other DTCs stored?	guarante guarante
2	Repair these DTCs first before of the following steps.	performing any ◆ GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 68.
3	Using the Scan Tool, erase the Refer to	e DTC memory. – YES: ♦ GO TO: Step 4 ⇒ page 13.
	⇒ "3.3.4 Diagnostic Mode 04 –	Erase DTC
	Memory", page 21	 NO: GO TO: Step 5 ⇒ page 13.
	 Perform a road test to attempt customers complaint. 	e DTC memory. - YES: GO TO: Step 4 ⇒ page 13. - NO: To duplicate the Output The page 13 in the page 13 i
	– Does DTC return? ថ្មី	60
4	Perform the diagnostic procedu	stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 68.
5	FAULT: Intermittent or a spora	idic condition. Perform a road test to verify the repair.
	CHECK: Suspected componer	onts. ♦ Generate readiness code. Refer to
	PERFORM: Visual Inspection components.	of wiring and ⇒ "3.2 Readiness Code", page 14.
	CHECK: Wiring for open, high short or harness connector for sion, loose or broken terminals	damage, corro-
	REPAIR: Faulty wiring or conn	nector. May

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Fuel System Mechanical Testing

Check the following items for possible mechanical delivery deficiency:

- Fuel level in tank is too low.
- Fuel lines pinched.
- Fuel filter plugged.
- Fuel pump delivery unit internal leak.
- Clogged injectors.
- Poor fuel quantity delivery. Refer to appropriate repair manual.

Oxygen Sensor Preliminary Tests

Check for the following conditions which can cause Oxygen Sensor Faults to set without requiring Oxygen Sensor replacement:

Common issues for lean faults:

- "Opriate repair manual.

 cause Oxygen Senvinsor replacement:

 um lines, leaking stered air leaks

 m lines.

 Mass Air Flow Vacuum leaks - check for failed or loose vacuum lines, leaking intake gaskets, or any other source of un-metered air leaks (leaks after the Mass Air Flow Sensor).
- Restricted fuel filter or bent/pinched fuel system lines.
- Incorrect input from other sensors, such as the Mass Air Flow Sensor, which may not always set a fault. Protected by copyright, C.
- Engine misfire.
- Exhaust leaks.
- Camshaft timing.

Common issues for rich faults:

- Leaking or faulty fuel injector.
- Fuel injector driver shorted in ECM, or wiring short for injectors (short to ground).
- Leaking or faulty fuel pressure regulator or restricted return line.
- Faulty fuel pump or fuel pump driver module.
- Incorrect input from other sensors, such as the Mass Air Flow Sensor, which may not always set a fault.
- Aftermarket components or performance chips.
- Camshaft timing.

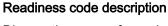
Readiness Code 3.2



Caution

When performing the Readiness drive cycle operation, pay strict attention to driving conditions and observe and obey all posted speed limits.

Diagnostics are performed at regular intervals during normal vehicle operation. After repairing an emissions related system, a readiness code is generated by road testing the vehicle.



If a malfunction is recognized during the drive cycle, it will be stored in the DTC memory.

The OBD drive cycle operation will be monitored with a hand held diagnostic tool. Consult the manufacturer's instruction manual for correct tool operation.

The readiness code is erased every time the DTC memory is erased or any time the battery is disconnected. If the DTC memory has been erased or the battery is disconnected, a new readiness code must be generated.

Only erase the DTC memory if a DTC has been stored.

General recommendations

Most monitors will complete easier and quicker using a "steadyfoot" and "smooth" acceleration during the drive cycle operation.

Operating conditions

For the EVAP monitor test, the coolant temperature and the ambient air temperature must be between 10° C and 35° C with a difference between them no greater than 4° C. The ambient air temperature must not change more than 4° C during the drive cycle procedure (e.g. when driving out of a heated workshop in the winter).



Note

Do not assume that the scan tool ID and engine code are correct if the scan tool communicates. The scan tool does not use the ID to establish communication—the units are automatically identified.

Test requirements

- NO DTC in memory.
- Switch OFF all electrical and electronic accessories.
- Necessary driving speed: 50 70 mph.
- Drive profile takes approximately 60 90 min.

Readiness Drive Cycle Procedure

to esta fied.	equirements DTC in memory. itch OFF all electrical and electronic accessories. cessary driving speed: 50 – 70 mph. ve profile takes approximately 60 – 90 min. ness Drive Cycle Procedure NNECT: Scan Tool.	iae.	NU-	
Test re	equirements			
• NO	DTC in memory.	AG.	Volkswagen AG doc	
• Sw	itch OFF all electrical and electronic accessories.		ses not guara	
• Ne	cessary driving speed: 50 – 70 mph.		ante or	
• Driv	ve profile takes approximately 60 – 90 min.		acc sp.	
Readir	ness Drive Cycle Procedure		92	
- CO	NNECT: Scan Tool.		B	
Step	Procedure		Result / Action to Take]
1	Activate Monitors:	•	Monitoring Active.	
	START: Engine and idle for 2 – 3 min.	*	Monitoring Active. Executes Misfire Monitoring.	
2	O2 Sensor Monitoring:	•	Executes O2 Sensor Monitoring.	
	 DRIVE: Vehicle at 45 – 55 mph for a continuous 7 minute period. Avoid stopping. 	•	Executes Fuel Trim Monitoring.	
	Iburp	•	Executes EVAP Monitoring.	
3	Fuel Cut-Off Monitoring: • ACCELERATE: Vehicle to an engine speed of	•	Executes O2 Sensor Monitoring. Executes Fuel Trim Monitoring. Executes EVAP Monitoring. Fuel Cut-Off Monitoring Ready.	1
	5,000 RPM; lift off the throttle until the engine		tion	
	speed is around 1,200 RPM.			
	"Apple		alinadi	
	Oundo.		100,180	
	ingingo.		Managina	
	india folisticos tabilidos superiores indias folisticos superiores superiores indias folisticos superio		.DA Nagsweylo L.	
			DA negewealo Volkewagen AG.	_
			Diagnosis and Testing	•

Step	Procedure	Result / Action to Take
4	Catalyst Monitoring:	◆ Executes Catalyst Monitoring.
	 ACCELERATE: Vehicle smoothly to 60 – 65 mph, cruise at a constant speed for 5 min. 	◆ Executes O2 Sensor Monitoring.
		◆ Executes Fuel Trim Monitoring.
		◆ Executes Misfire Monitoring.
		◆ Executes EVAP Monitoring.
5	Secondary Air Injection, EVAP Monitoring:	◆ Executes Secondary Air Injection Monitoring.
	DRIVE: Vehicle for 30 – 40 min. at a constant speed of 50 – 70 mph in high gear for 2 min	◆ Executes EVAP Monitoring.
	with no coasting.	Check the status of the readiness code.



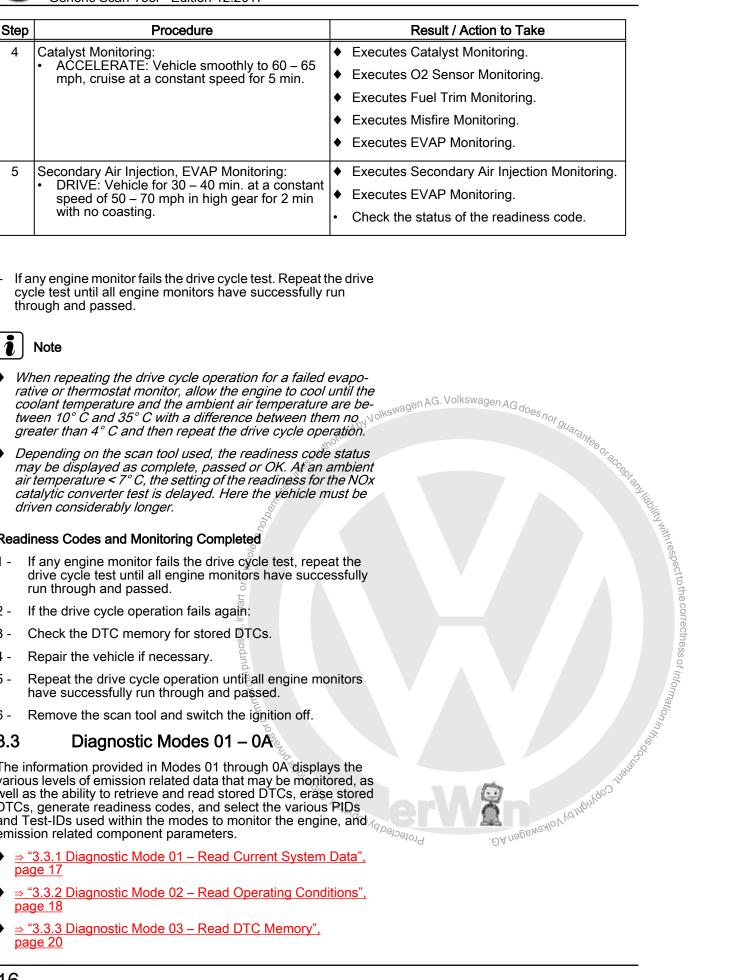
Readiness Codes and Monitoring Completed

- 2 -
- 3 -
- 4 -
- 6 -

3.3

The information provided in Modes 01 through 0A displays the various levels of emission related data that may be monitored, as well as the ability to retrieve and read stored DTCs, erase stored DTCs, generate readiness codes, and selectine values and Test-IDs used within the modes to monitor the engine, and replaced component parameters.

- <u>page 20</u>



3.3.1



Depending on the scan tool and protocol used, the information in diagnostic mode 01 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), or On-Board Diagnostic Monitor Identifier (OBDMID).

...ostic Mode 04 – Erase DTC Memory",

...Diagnostic Mode 05 – Read Cygen Sensor Monitorst Results", page 22

3.3.6 Diagnostic Mode 06 – Read Test Results for Specific
piagnostic Functions, 2013 – 2014 MY", page 23

**3.3.7 Diagnostic Mode 06 – Read. Test Results for Specific
Diagnostic Functions, 2015 MY", page 43

**3.3.8 Diagnostic Mode 06 – Read Test Results for Specific
roostic Functions, 2016 MY", page 40

1 Diagnostic Mode 06 – Read Test Results for Specific
c Functions, 2018 MY", page 48

**qnostic Mode 06 – Read Test Results for Specific
rotions; 2018 MY", page 56

**lic Mode 07 – Read Faults Detected During
Driving Cycle*, page 64

**lode 08 – Request Control of On-Board
**rent", page 64

**lode 08 – Read Vehicle Information",

**heck Permanent DTC Mem
**Read Current*

**Read Current* Diagnostic Mode 01 makes it possible to access current emissions-related measured values and diagnostic data. The original measured values (no replacement values), input and output data and system status information are displayed using Diagnostic Mode 1.

Test requirement

Coolant temperature at least 80° C.

Procedure

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 1: Obtain data".
- From the following table, select the desired "PID" that is to be monitored, e.g. "PID \$05 Coolant Temperature".

The current values of the component or system that is being monitored will be displayed on the scan tool screen.

PID	Component or System
\$01:	Monitoring Status Since Erasing DTC Memory
\$03:	Condition Of Fuel System
\$04:	Calculated Load Value

PID	Component or System
\$05:	Coolant Temperature
\$06:	Short Term Air Fuel Ratio
\$07:	Long Term Air Fuel Ratio
\$0B:	Intake Manifold Absolute Pressure
\$0C:	Engine RPM
\$0D:	Vehicle Speed
\$0E:	Ignition Timing Advance For #1 Cylinder
\$0F:	Intake Air Temperature
\$10:	Air Flow Rate From Mass Air Flow Sensor
\$11:	Absolute Throttle Position
\$12:	Secondary Air Injection
\$13:	Oxygen Sensor Bank 1 Sensor 1
\$15:	Oxygen Sensor Bank 1 Sensor 2
\$16:	Oxygen Sensor Bank 1 Sensor 3
\$1C:	OBD Requirements
\$1F:	Time Since Engine Start
\$21:	Distance Driven With MIL On
\$23:	Fuel Rail Pressure
\$2E:	Commanded Evap Purge
\$2F:	Fuel Level Input Warm Up Counts After MIL Erased AG. Volkswagen AG. dees not guarantees Distance Driven After Erasing DTC Memory Barometric Pressure
\$30:	Warm Up Counts After MIL Erased AG. Volkswagen AG. do
\$31:	Distance Driven After Erasing DTC Memory
\$33:	Barometric Pressure
\$34:	Heater Current Bank 1 Sensor 1
\$3C:	Calculated Catalyst Temperature
\$41:	Monitor Status Current Drive Cycle
\$42:	Control Module Voltage
\$43:	Absolute Load Value
\$44:	Specified Value Of Oxygen Sensor Signal
\$45:	Relative Throttle Valve Position
\$46:	Ambient Temperature
\$47:	Throttle Valve Position 2 Absolute
\$49:	Accelerator Pedal Position 1 Absolute
\$4A:	Accelerator Pedal Position 2 Absolute
\$4C:	Specified Throttle Valve Position
\$51:	Type Of Fuel Currently Being Used
\$56:	Offset Oxygen Sensor Regulation After Catalytic Convertor
\$6D:	Fuel Pressure Control System
Switch the igni	on off. nostic Mode 02 – Read Operating
•	itions Protected by Protected b

Diagnostic Mode 02 – Read Operating Conditions 3.3.2

When an emissions-related fault (pending DTC, visible in mode 07) is first detected, operating conditions are stored. Mode 02 makes it possible to access this freeze frame data as soon as this fault is shown in mode 03. Each control module only shows freeze



frame data for one fault via mode 02. Therefore, there are two priority levels. If there is a malfunction with higher priority, the freeze frame data is overwritten.

- Fault with higher priority: Misfire malfunction or fuel trim malfunction.
- Fault with normal priority: All other emissions related faults.



Note

Procedure

- Connect the scan tool.
- Start the engine and run at idle.



Note

- Select "Diagnostic Mode 2: Obtain operating conditions".
- From the following table, select the desired "PID", e.g. "PID \$05 Coolant Temperature" that is to be monitored.

frame data for one fault via mode 02. Therefore, there are two priority levels. If there is a malfunction with higher priority, the freeze frame data is overwritten.									
 Fault with higher priority: Misfire malfunction or fuel trim mal- function. 									
- Fault with normal priority: All other emissions related faults. Note **Read To Market State of the Control									
	www.volkswago.								
Note	orised by								
Depending on the scan tool a diagnostic mode 02 may be	and protocol used, the information in referred to by different names such ent-ID, or On-Board Diagnostic Mon-								
Procedure									
Connect the scan tool.	esp.								
2.	A : all a								
Note Start the engine and run a	All other emissions related faults. All other emissions related faults. and protocol used, the information in referred to by different names such ent-ID, or On-Board Diagnostic Monard the ignition off afterward. 2: Obtain operating conditions". select the desired "PID", e.g. "PID " that is to be monitored. mponent or system that is being in the scan tool screen. Component or System								
least 5 seconds, do not switch	th the ignition off afterward.								
 Select "Diagnostic Mode 2 	2: Obtain operating conditions".								
 From the following table, s \$05 Coolant Temperature 	select the desired "PID", e.g. "PID " that is to be monitored.								
The current values of the cor	mponent or system that is being								
monitored will be displayed of	on the scan tool screen.								
	Component or System								
monitored will be displayed of	Component or System DTC Which Triggered Freeze Frame Data								
monitored will be displayed o									
PID \$02:	DTC Which Triggered Freeze Frame Data								
PID \$02:	DTC Which Triggered Freeze Frame Data Fuel System Status								
PID \$02: \$03: \$04:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value								
PID \$02: \$03: \$04: \$05:	Fuel System Status Calculated Load Value Coolant Temperature								
PID \$02: \$03: \$04: \$05: \$06:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio								
## PID \$02: \$03: \$04: \$05: \$06: \$07:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio								
## PID \$02: \$03: \$04: \$05: \$06: \$07: \$08: \$00: \$00: \$00:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed								
### PID \$02: \$03: \$04: \$05: \$06: \$07: \$08: \$0C: \$0C: \$0C: \$0.	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM								
## PID \$02: \$03: \$04: \$05: \$06: \$07: \$08: \$00: \$00: \$00:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature								
### PID \$02: \$03: \$04: \$05: \$06: \$07: \$08: \$0C: \$0D: \$0E: \$0F: \$10:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature Air Flow Rate From Mass Air Flow Sensor								
## PID \$02: \$03: \$04: \$05: \$06: \$07: \$08: \$00: \$05: \$05: \$06: \$07: \$08: \$07: \$08: \$07: \$08: \$07: \$08:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature								
### PID \$02: \$03: \$04: \$05: \$06: \$07: \$08: \$0C: \$0D: \$0E: \$10: \$11: \$12: \$12:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature Air Flow Rate From Mass Air Flow Sensor Throttle Valve Position 1 Absolute Secondary Air Injection								
### PID \$02:	Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature Air Flow Rate From Mass Air Flow Sensor Throttle Valve Position 1 Absolute Secondary Air Injection Time Since Engine Start								
## PID \$02:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature Air Flow Rate From Mass Air Flow Sensor Throttle Valve Position 1 Absolute Secondary Air Injection								
### PID \$02:	Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature Air Flow Rate From Mass Air Flow Sensor Throttle Valve Position 1 Absolute Secondary Air Injection Time Since Engine Start Fuel Rail Pressure Commanded Evap Purge								
PID \$02: \$03: \$04: \$05: \$06: \$07: \$0B: \$0C: \$0D: \$11: \$11: \$12: \$15: \$23:	Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature Air Flow Rate From Mass Air Flow Sensor Throttle Valve Position 1 Absolute Secondary Air Injection Time Since Engine Start Fuel Rail Pressure								
## PID \$02: \$03: \$04: \$05: \$06: \$07: \$08: \$00: \$00: \$00: \$00: \$00: \$00: \$11: \$12: \$11: \$12: \$15: \$23: \$25: \$25: \$33:	Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature Air Flow Rate From Mass Air Flow Sensor Throttle Valve Position 1 Absolute Secondary Air Injection Time Since Engine Start Fuel Rail Pressure Commanded Evap Purge								
### PID \$02:	DTC Which Triggered Freeze Frame Data Fuel System Status Calculated Load Value Coolant Temperature Short Term Air Fuel Ratio Long Term Air Fuel Ratio Intake Manifold Absolute Pressure Engine RPM Vehicle Speed Ignition Timing Advance For #1 Cylinder Intake Air Temperature Air Flow Rate From Mass Air Flow Sensor Throttle Valve Position 1 Absolute Secondary Air Injection Time Since Engine Start Fuel Rail Pressure Commanded Evap Purge Fuel Level Input								

PID	Component or System	G does not						
\$44:	Commanded Equivalence Ratio	HOT GUALANTE						
\$45:	Relative Throttle Valve Position	The Opposite of the Control of the C						
\$46:	Ambient Temperature	CCEDA						
\$47:	. 8							
\$49:	Accelerator Pedal Position 1 Absolute							
\$4A:	Accelerator Pedal Position 2 Absolute							
\$4C:	Specified Throttle Valve Position							
\$51:	Type Of Fuel Currently Used							
\$56:	Offset Oxygen Sensor Regulation After Catalytic Con-	vertor						
\$6D:	Fuel Pressure Control System							
Ory agnostic Mode 03 makes i ilts (confirmed DTCs; fauli EECM and in the TCM.	it possible to read emissions-related ts which have activated the MIL) in							
en the ECM recognizes a utive drive cycles, it send	an emissions-related fault in two con- ls a request to the instrument cluster malfunction indicator lamp. If an elec- recognized, the ECM will send and particular and the CAN to turn on the ming lamp.	vertor vertor uebeweylo V V V V V V V V V V V V V V V V V V V						
•	code with the DTC tables consisting lue.							
Note								

. 0 \/ollcovic

Diagnostic Mode 03 Read DTC Mem-3.3.3 ory



Note

Depending on the scan tool and protocol used, diagnostic mode 03 and the information provided may be referred to by a different name.

The following tables provide a breakdown and explanation of the DTC code.

P-Codes

Compo	Component group							
Р	х	х	х	х	DTC for the drivetrain			
Norm-C	Norm-Code							
Р	0	х	х	х	Trouble codes defined by SAE with specified malfunction texts			
Р	1	x	х	х	Additional emission relevant DTCs provided by the manufacturer			
Р	2	х	х	х	DTCs defined by SAE with specified texts, from MY 2000			
Р	3	x	х	x	Additional emission relevant DTCs provided by the manufacturer from MY 2000			

Component group						
Repair group						
Р	х	0	х	х	Fuel and air mixture and additional emission regulations	

X	1	х	х	Fuel and air ratios
Х	2	х	х	Fuel and air ratios
Х	3	х	х	Ignition system
х	4	х	х	Additional exhaust system
Х	5	х	x	Speed and idle control
Х	6	х	X X	Control module and output signals
х	7	х	x tori	Transmission
Х	8	х	x bar	Transmission
Х	9	х	X	Control modules, input and output signals
	x x x x x x	x 2 x 3 x 4 x 5 x 6 x 7 x 8	x 2 x x x 3 x x 4 x x 5 x x 6 x x 7 x x 8 x	x 2 x x x x x x x x x x x x x x x x x x

U-Codes

Comp	onent	group		_	mmin and the state of the state				
U	х	х	х	x	DTC for network (CAN bus)				
Norm-Code The state of the stat									
U	0	x	x	x	Trouble codes defined by SAE with specified malfunction texts				
	•	,	·		DA Nagrand No. Volumented by Copyrights Ophical Day of the Copyrights of the Copyrig				
Proced	dure				10/kswagen Protected by				
– Co	- Connect the scan tool.								

Procedure

- Connect the scan tool.
- Switch the ignition to the ON position.
- Select Diagnostic Mode 03: Interrogating fault memory.
- The stored DTC or DTCs will be displayed on the scan tool

The following table is an example of the DTC information that may be displayed on the scan tool screen:

Indication example	Explanation
P0444	SAE Diagnostic Trouble Code
Evaporative emission canister purge regulator valve	Malfunctioning wiring path or malfunctioning component
Circuit open	Malfunction type as next

- Refer to the DTC tables below for the diagnostic repair procedures.
- ⇒ "3.4.1 Engine Control Module, 2013 2014 MY",
- ⇒ "3.4.2 Engine Control Module, 2015 MY", page 169
- ⇒ "3.4.3 Engine Control Module, 2016 MY", page 365
- ⇒ "3.4.4 Engine Control Module, 2017 MY", page 560
- ⇒ "3.4.5 Engine Control Module, 2018 MY", page 766
- Switch the ignition off.

Diagnostic Mode 04 - Erase DTC Mem-3.3.4 ory

Diagnostic Mode 04 makes it possible to erase the DTC memory and to reset all emissions-related diagnostic data. In that way, all



faults in the DTC memory in the ECM and TCM are erased. The adaptation values may also be reset.

Emissions-related diagnostic data includes (as applicable):

- MIL Status
- Number of DTCs
- Readiness bits
- Confirmed DTCs
- Pending DTCs
- DTC that belongs to freeze frame
- Freeze frame data
- Test results of specific diagnostic functions
- Distance driven with "MIL ON"
- Number of warm-up cycles after erasing the DTC memory
- Distance driven after erasing the DTC memory
- Misfire counter



Note

Depending on the scan tool and protocol used, diagnostic mode 04 and the information provided may be referred to by a different

Procedure

- Connect the scan tool.
- Switch the ignition on.
- Select Diagnostic Mode 03: Interrogating fault memory.
- Then select Mode 4: Reset/delete diagnostic data.

The scan tool will display "Diagnostic data being erased".

Switch the ignition off.

3.3.5 Diagnostic Mode 05 – Read Oxygen Sensor Monitoring Test Results



Note

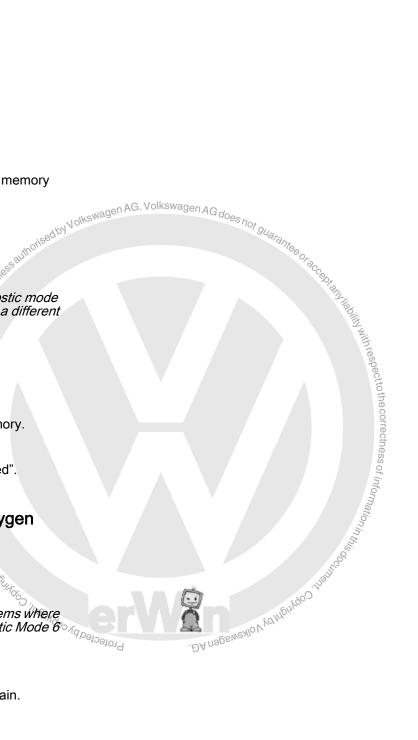
Mode 05 may not be supported on all systems. On systems manifered on all systems. On systems manifering test results.

Test Requirements

No Test requirements are available for this powertrain.

Function Test

No Function Tests are available for this powertrain.





3.3.6 Diagnostic Mode 06 – Read Test Results for Specific Diagnostic Functions, 2013 - 2014 MY

Diagnostic Mode 06 makes it possible to retrieve test results for special components and systems which are continuously or not continuously monitored. If the diagnosis of a system is complete, the diagnostic result and the corresponding thresholds are saved and displayed in mode 06. This data remains saved (even with the ignition off) until either new diagnostic results become available or the DTC memory is erased.

The min & max values for each individual test in Mode 06 represent the min & max operating values for a properly operating system. This data is provided to the individual aftermarket scan tool companies for development of their scan tool. Depending on the scan tool being used, the min & max values shown may vary, or be rounded up or down to the nearest decimal point depending on the aftermarket scan tool company's development process.

For example; GST manual documentation will show the value as 0.3499 (units) while the scan tool will display the same value as 0.35 (units).

Depending on the scan tool and protocol used, the information displayed in Diagnostic Mode 06 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), On-Board Diagnostic Monitor Identifier (OBDMID), or contain no name at all and may be referenced by only a number.

Test requirements

- Exhaust system must be properly sealed between the catalytic . DA nagswealo V Yorky converter and the cylinder heads.
- No DTCs stored in the DTC memory
- Coolant temperature at least 80° C.

Work procedure

- Connect the scan tool.
- Start the engine and let run at idle speed.
- Select Mode 6: Check / test the results of components that are not continuously monitored.

Select the desired Test-ID.

The current minimum and maximum values will be displayed on the scan tool screen.

The following table is a numerical list of all "Test-IDs" that may be selected.

Monitor-ID (Hex-ID)	Component or System
\$01: <u>⇒ page 24</u>	Oxygen Sensor Monitor Bank 1 – Sensor 1
\$02: <u>⇒ page 24</u>	Oxygen Sensor Monitor Bank 1 – Sensor 2
\$03: <u>⇒ page 25</u>	Oxygen Sensor Monitor Bank 1 – Sensor 3
\$21: <u>⇒ page 26</u>	Catalytic Converter Monitoring
\$35: <u>⇒ page 26</u>	Camshaft Adjustment / VVT Bank 1
\$3A: <u>⇒ page 26</u>	Fuel Tank EVAP System Integrity/Leak Test (0.090")
\$3B: <u>⇒ page 27</u>	Fuel Tank EVAP System Integrity/Leak Test (0.040" / 1.0 mm)
\$3C: <u>⇒ page 27</u>	Fuel Tank EVAP System Integrity/Leak Test (0.020" / 0.5 mm)
\$3D: <u>⇒ page 28</u>	EVAP Valve Function Check

Monitor-ID (Hex-ID)	Component or System
\$41: <u>⇒ page 29</u>	Oxygen Sensor Heater Monitor Bank 1 – Sensor 1
\$42: <u>⇒ page 29</u>	Oxygen Sensor Heater Monitor Bank 1 – Sensor 2
\$43: <u>⇒ page 30</u>	Oxygen Sensor Heater Monitor Bank 1 – Sensor 3
\$71: <u>⇒ page 30</u>	Secondary Air Injection System
\$A2: <u>⇒ page 31</u>	Mis-Fire Cylinder 1 Data
\$A3: <u>⇒ page 31</u>	Mis-Fire Cylinder 2 Data
\$A4: <u>⇒ page 32</u>	Mis-Fire Cylinder 3 Data
\$A5: <u>⇒ page 32</u>	Mis-Fire Cylinder 4 Data

Monitor-ID \$01: Oxygen Sensor Monitor Bank 1 – Sensor 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$01".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$83	P0133	Response Check Bank 1 Sensor 1.	0.250 V	1.999 V	Refer to DTC P0133 in the DTC summary table. ⇒ page 84
\$84	P2195 / P2196	Front To Rear Rationality Bank 1 Sensor 1.	-0.080 V	0.080 V	Refer to DTC P2195 / P2196 in the DTC summary table. ⇒ page 150
\$89	P0133	Signal Dynamic Bank 1 Sensor	0.250 V	1.999 V	Refer to DTC P0133 in the DTC summary table. ⇒ page 84
\$8A	P2195	Oxygen Sensor Lean Fault Detection Bank 1 – Sensor 1.	-32.768	0.890	Refer to DTC P2195 in the DTC summary table page 150
\$8B	P2196	Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	1.060	32.767	Refer to DTC P2196 in the DTC summary table. ⇒ page 151

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - "3.3.3 Diagnostic Mode 03 Read DTC Memory", <u>page 20</u>.
- Switch the ignition off.

Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 – Sensor 2

- Connect the scan took
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". J. Addrago Mongoo Kabababalong

Select "Monitor-ID \$02".

- Select the desired "Test-ID".
- Check specified values at idle.



Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$05	P013A	Deceleration Test – O2 Transient Time.	0.0 s	0.500 s	Refer to DTC P013A in the DTC summary table. ⇒ page 86
\$81	P2271	Output Voltage Rich During Decel.	0.0 V	0.801 V	Refer to DTC P2271 in the DTC summary table. ⇒ page 154
\$82	P2270	Output Voltage Lean During Accel.	0.598 V	1.130 V	Refer to DTC P2270 in the DTC summary table. ⇒ page 153
\$8A	P2271	Deceleration Test Response Time.	0.0 V	0.149 V	Refer to DTC P2271 in the DTC summary table. ⇒ page 154
\$8E	P2270	Oxygen Sensor Maximum Oscillation Voltage.	0.752 V	7.99 V	Refer to DTC P2270 in the DTC summary table. ⇒ page 153
\$8F	P2271	Oxygen Sensor Minimum Oscillation Voltage.	0 V	0.15100 V	Refer to DTC P2271 in the DTC summary table. ⇒ page 154

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - \Rightarrow "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$03: Oxygen Sensor Monitor Bank 1 – Sensor 3

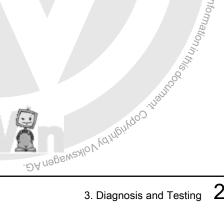
- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$03".

- Select the desired "Test-ID".
- Check specified values at idle.

001000 11	Coloct Monitor 15 400.							
Selection	t the desi	red "Test-ID".	Nolkswagen AG. Volkswagen AG does not guarante					
- Checl	k specifie	d values at idle.	7,70		NOT GUAFANTA			
Test-ID	DTC	Component or System	Min.	Max.	Additional Information			
\$05	P0145	Deceleration Test – 02 Transient Time.	0.0 m/s	1.2 s	Refer to DTC P0145 in the DTC summary table. > page 87			
\$81	P2275	Output Voltage Rich During Decel.	0.0 V	0.801 V	Refer to DTC P2275 in the DTC summary table. page 154			
\$82	P2274	Output Voltage Lean During Accel.	0.598 V	1.130 V	Refer to DTC P2274 in the DTC summary table. page 154			
\$8A	P2275	Deceleration Test Response Time.	0.0 V	0.149 V	Refer to DTC P2275 in the DTC summary table. page 154			
\$8E	P2274	Oxygen Sensor Maximum Oscillation Voltage.	0.698 V	7.99 V	Refer to DTC P2274 in the DTC summary table. page 154			
\$8F	P2275	Oxygen Sensor Minimum Oscillation Voltage.	0.0 V	0.151 V	Refer to DTC P2275 in the DTC summary table. page 154			

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20 Protected by copyright, Copyright
- Switch the ignition off.



Monitor-ID \$21: Catalytic Converter Monitoring

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$21".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$84	P0420	Catalytic Converter Monitoring Bank 1.	100.0%		Refer to DTC P0420 in the DTC summary table. ⇒ page 116

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20

Switch the ignition off.

Monitor-ID \$35: Camshaft Adjustment / IVVT Bank 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$35".

- lect "Monitor-ID \$35".

 Select the desired "Test-ID".

 Check specified values at idle is a did in the control of the control o

Test-ID	DTC	Component or System	Min.	Max.	Additional Information		
\$80	P0011	V V T Specified Position Not Reached.	-32 Deg. KW	28 Deg. KW	Refer to DTC P0011 in the DTC summary table. ⇒ page 71		
\$81	P000A	V T Specified Position Is Reached Too Slow.	-32 Deg	28 Deg. KW	Refer to DTC P000A in the DTC summary table ⇒ page 69		
Reached Too Slow. KW summary table page 69							
26 Re	Rep. Gr.ST - Generic Scan Tool						

Monitor-ID \$3A: Fuel Tank EVAP System Integrity / Leak Test (0.090")

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Protected by copyright.

- Select the desired "Test-ID".
- Check specified values at idle.

 Select the desired "Test-ID". 							
Check specified values at idle.							
Test-ID DTC Component or System Min. Max. Additional Information							
\$81	P0455	Tank Leak Test: Large Leak.	950.0 s	65.535 s	Refer to DTC P0455 in the DTC summary table. ⇒ page 120		
If any	of the cou	mananta or avetema faildisedby	likswagen AG.	volkswa gen z	G does not guarante		
\$81 P0455 Tank Leak Test: Large Leak. 950.0 s 65.535 s Refer to DTC P0455 in the DTC summary table. ⇒ page 120 - If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20 - Switch the ignition off. Monitor-ID \$3B: Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm) - Connect the scan tool. Start the engine and runat idle. - Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$3B". Select the desired "Test-ID". - Check specified values at idle.							
Switc	h the ignit	ion offŚ					
Monitor-I (0.040" /	D \$3B: Fi 1.0 mm)	uel Tank EVAP System Integrity /	Leak Test		espect to		
– Conn	ect the sc	an tool. Durantool.			the		
- Start	the engine	e and runeat idle.			COFFE		
- Select "Diagnostic Mode 06: Check / test the results of components that are not confinuously monitored".							
Select "N	/lonitor-ID	\$3B".			of in		
- Select the desired "Test-ID".							
- Chec	k specified	d values at idle.			ttion in		
Test-ID	DTC	Component or System	Min	Max	Additional Information		

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 ¬Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$3B: Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3B".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$81	P0442	Fuel Tank Leak Test: Small Leak.	1.550 s	65.535 s	Refer to DTC P0442 in the DTC summary table. ⇒ page 119
\$86 (2013 > MY)	P0442	Fuel Tank Leak Test: Small Leak.	900.0 Pa		Refer to DTC P0442 in the DTC summary table. ⇒ page 119
\$87 (2013 > MY)	P0442	Fuel Tank Leak Test: Long Cycle.	0.0 mA	255.996 [∀] mA	Refer to DTC P0442 in the DTC summary table. ⇒ page 119
\$88 (2013 > MY)	P0442	Fuel Tank Leak Test: Short Cycle.	0.0 mA	255.996 mA	Refer to DTC P0442 in the DTC summary table. ⇒ page 119
\$8B (2013 > MY)	P0441	Purge Valve Functional Check.	0.0	19.98	Refer to DTC P0441 in the DTC summary table. ⇒ page 118

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$3C: Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".



Select "Monitor-ID \$3C".

- Select the desired "Test-ID".
- Check specified values at idle.

Calact "N	Annitor ID	¢2C"	authorise		anteen		
	/lonitor-ID	\$3C .	105572		5,0	CCO	
Select "Monitor-ID \$3C". - Select the desired "Test-ID". - Check specified values at idle.							
Checl	k specified	d values at idle.				labli:	
Test-ID	DTC	Component or System	Min.	Max.	Additional Information	THE WAR	
\$81	P0456	Tank Leak Test: Pinhole Leak (0.5 mm).	4,500.0 ms	65,535.0 ms	Refer to DTC P0456 in the DTC summary table. ⇒ page 121	nrespec	
\$82		Evap System Monitor Ok By Initial Purge Test.	12.0 g	6553.5 g	Pass only.	ct to the	
\$84 (2013 > MY)	P0456	Tank Leak Test: Very Small Leak.	0.0	0.170	Refer to DTC P0456 in the DTC summary table. ⇒ page 121	correctne	
Select the desired "Test-ID". - Check specified values at idle. Test-ID DTC Component or System Min. Max. Additional Information							
Select "N	/lonitor-ID	\$3D".					
Selection	t the desi	red "Test-ID".					
- Checl	Check specified values at idle.						

Monitor-ID \$3D: EVAP Valve Function Check

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3D".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$80	P0441	Tank Vent Valve Check From % DTEV: Active Test Air Balance At Idle Ok, (Normal Operation And Short Test 70).	0.350	1.999	Refer to DTC P0441 in the DTC summary table. ⇒ page 118
\$82	l	Tank Vent Valve Check From % DTEV: Active Test, Oxygen Sensor Regulator Deviating In Lean Direction (Can Only Test Ok), (Normal Operation And Short Test 70).	1.0	65,355.0	Pass only.
\$88 (2012 > MY)	l	Purge Flow Ok By Deviation Lambda Control.	1.0	65,355.0	Pass only.
\$8C (2013 > MY)	P0441	Purge Flow Monitor Valve Open.	0.0 mA	4.2 – 14.0 mA	Refer to DTC P0441 in the DTC summary table. ⇒ page 118
\$8D (2013 > MY)	P0441	Purge Flow Monitor Valve Closed.	0.0 mA	4.3 – 36.3 mA	Refer to DTC P0441 in the DTC summary table. ⇒ page 118

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure





- ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$41: Oxygen Sensor Heater Monitor Bank 1 – Sensor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$41".

- Select the desired "Test-ID".
- Check specified values at idle.

	- Crieck specified values at fule.							
Test-ID	DTC	Component or System	Min.	Max.	Additional Information			
\$81	P0141	Oxygen Sensor Heating Between Catalytic Converter, Diagnosis, Bank 1 Sensor 2 Internal Resistance Test.	0.0 Ω	4.56 kΩ	Refer to DTC P0141 in the DTC summary table. ⇒ page 86			
\$85 (2012 > MY)	P0135	Oxygen Sensor Ceramic Temp Bank 1 Sensor 1.	715° C	6,513.5° C	Refer to DTC P0135 in the DTC summary table. ⇒ page 84			
 If any values ory to repair ⇒ "3.3 page : Switch Monitor-I 2 	ween Catalytic Converter, Diagnosis, Bank 1 Sensor 2 Internal Resistance Test. \$85 (2012 > MY) P0135 Oxygen Sensor Ceramic Temp Bank 1 Sensor 1. If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Internogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure "3.3.3 Diagnostic Mode 03 = Read DTC Memory". Page 20 Switch the ignition off. Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 − Sensor Connect the scan tool. Start the engine and run at idle. Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$42". Select the desired "Test-ID". Check specified values at idle. Test-ID DTC Component or System Min. Max. Additional Information							
- Conne	ect the sc	an tool.			With res			
Start t	he engine	e and run at idle.			spect			
Select poner	- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".							
Select "Monitor-ID \$42".								
- Select the desired "Test-ID".								
- Check	- Check specified values at idle.							
Test-ID	DTC	Component or System	Min.	Max.	Additional Information			

Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 – Sensor

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$81	70	Oxygen Sensor Heating Between Catalytic Converter, Diagnosis, Bank 1 Sensor 2 Internal Resistance Test.	0.0 Ω		Refer to DTC P0141 in the DTC summary table. ⇒ page 86

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20

Switch the ignition off.

Monitor-ID \$43: Oxygen Sensor Heater Monitor Bank 1 – Sensor 3

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$43".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$81	(2012 >	Oxygen Sensor Heating Between Catalytic Converter, Diagnosis, Bank 1 Sensor 2 Internal Resistance Test.	0.0 kΩ		Refer to DTC P0141 in the DTC summary table. ⇒ page 86
\$81	P0147 (2012 > MY)	Resistance Test. Oxygen Sensor Heating Beolkswag tween Catalytic Converter, Diagnosis, Bank 1 Sensor 2 Internal Resistance Test.	len 0.0 kΩ Ses no	4.560 kΩ	Refer to DTC P0147 in the DTC summary table. ⇒ page 88

 If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20

Switch the ignition off.

Monitor-ID \$71: Secondary Air Injection System

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$71".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$82	P0491	Secondary Air Injection System Function Test	0.102 V	1.999 V	Refer to DTC P0491 in the DTC summary table. ⇒ page 123
\$85	P0410	Secondary Air Injection Pressure Check.		5.0 kPa	Refer to DTC P0410 in the DTC summary table. ⇒ page 113
\$8A	P2440	Secondary Air Injection Leak Check.	0.0	1.289	Refer to DTC P2440 in the DTC summary table. ⇒ page 164
\$8C (2013 > MY)	P2440	Tightness Check Bank 1.	0.0	1.340	Refer to DTC P2440 in the DTC summary table. ⇒ page 164

 If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory" <u>page 20</u> .

Switch the ignition off.

Monitor-ID \$A2: Mis-Fire Cylinder 1 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A2".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information		
\$0B	P0301	Misfire Cylinder 1, Average Value Over 10 Driving Cycles.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0301 in the DTC summary table: ⇒ page 101		
\$0C	P0301	Misfire Cylinder 12 In This Driving Cycle.	(counts)	65,535.0 (counts)	Refer to DTC R0301 in the DTC summary table. ⇒ page 101		
- DA Nageswaylo V Kolyny							
If any	- If any of the components or systems fail to meet the specified						

Protected by copyrig If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

"3.3.3 Diagnostic Mode 03 - Read DTC Memory", page 20 .

Switch the ignition off.

Monitor-ID \$A3: Mis-Fire Cylinder 2 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A3".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B		Misfire Cylinder 2, Average Value Over 10 Driving Cycles.	0.0 (counts)		Refer to DTC P0302 in the DTC summary table. ⇒ page 103
\$0C	P0302	Misfire Cylinder 2, In This Driving Cycle.	0.0 (counts)		Refer to DTC P0302 in the DTC summary table. ⇒ page 103

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

"3.3.3 Diagnostic Mode 03 - Read DTC Memory", <u>page 20</u> .

Switch the ignition off.

Monitor-ID \$A4: Mis-Fire Cylinder 3 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A4".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B		Misfire Cylinder 3, Average Value Over 10 Driving Cycles.	0.0 (counts)		Refer to DTC P0303 in the DTC summary table. ⇒ page 105
\$0C	P0303	Misfire Cylinder 3, In This Driving Cycle.	0.0 (counts)		Refer to DTC P0303 in the DTC summary table. ⇒ page 105

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20.

Switch the ignition off.

Monitor-ID \$A5: Mis-Fire Cylinder 4 Data

- Connect the scan tool.
- Start the engine and run at idle.
- DTC Memory",

 a

 "A of com
 The com Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A5".

- Select the desired "Test-ID"
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information 8
\$0B	P0304	Misfire Cylinder 4, Average Value Over 10 Driving Cycles.	0.0 (counts)		Refer to DTC P0304 in the DTC summary table. ⇒ page 107
\$0C	P0304	Misfire Cylinder 4, In This Driving Cycle.	0.0 (counts)		Refer to DTC P0304 in the DTC summary table. ⇒ page 107

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03 Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", Protected by co page 20 .

Switch the ignition off.





3.3.7 Diagnostic Mode 06 – Read Test Results for Specific Diagnostic Functions. 2015 MY

Diagnostic Mode 06 makes it possible to retrieve test results for special components and systems which are continuously or not continuously monitored. If the diagnosis of a system is complete, the diagnostic result and the corresponding thresholds are saved and displayed in mode 06. This data remains saved (even with the ignition off) until either new diagnostic results become available or the DTC memory is erased.

The min & max values for each individual test in Mode 06 represent the min & max operating values for a properly operating system. This data is provided to the individual aftermarket scan tool companies for development of their scan tool. Depending on the scan tool being used, the min & max values shown may vary, or be rounded up or down to the nearest decimal point depending on the aftermarket scan tool company's development process.

For example; GST manual documentation will show the value as 0.3499 (units) while the scan tool will display the same value as 0.35 (units).

Depending on the scan tool and protocol used, the information displayed in Diagnostic Mode 06 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), On-Board Diagnostic Monitor Identifier (OBDMID), or contain no name at all and may be referenced by only a number.

Test requirements

- Exhaust system must be properly sealed between the catalytic converter and the cylinder heads.
- No DTCs stored in the DTC memory.
- Coolant temperature at least 80° C.

Work procedure

- Connect the scan tool.
- Start the engine and let run at idle speed.
- Select Mode 6: Check / test the results of components that are not continuously monitored.

Select the desired Test-ID.

The current minimum and maximum values will be displayed on the scan tool screen.

The following table is a numerical list of all "Test-IDs" that may be selected

Monitor-ID (Hex-ID)	Component or System
\$01: <u>⇒ page 34</u>	Oxygen Sensor Monitor Bank 1 – Sensor 1
\$02°, page 34	Oxygen Sensor Monitor Bank 1 – Sensor 2
\$21: <u>⇒ page 35</u> • 5∀ ueb	Catalytic Converter Monitoring
\$35: <u>⇒ page 35</u>	Camshaft Adjustment / IVVT Bank 1
\$3B: <u>⇒ page 36</u>	Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)
\$3C: <u>⇒ page 36</u>	Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)
\$3D: <u>⇒ page 37</u>	EVAP Valve Function Check
\$41: <u>⇒ page 37</u>	Oxygen Sensor Heater Monitor Bank 1 – Sensor 1
\$42: <u>⇒ page 37</u>	Oxygen Sensor Heater Monitor Bank 1 – Sensor 2

Monitor-ID (Hex-ID)	Component or System
\$71: <u>⇒ page 38</u>	Secondary Air Injection System
\$A2: <u>⇒ page 38</u>	Mis-Fire Cylinder 1 Data
	Mis-Fire Cylinder 2 Data
	Mis-Fire Cylinder 3 Data
\$A5: <u>⇒ page 40</u> _{stoolise}	Mis-Fire Cylinder 4 Data

Monitor-ID \$01: Oxygen Sensor Monitor Bank 1 - Sensor 1

- Connect the scan tool
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$91".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information		
\$83	P0133	Response Check Bank 1 Sensor 4.	0.0 V	1.0 V	Refer to DTC P0133 in the DTC summary table. > page 194		
\$86	P0133	Signal Dynamic Bank 1 Sensor 1.	0.0 V	1.0 V	Refer to DTC P0133 in the DTC summary table. page 194		
\$8A	P2195	Oxygen Sensor Lean Fault Detection Bank 1 – Sensor 1.	0.85	1.15	Refer to DTC P2195 in the DTC summary table. <u>> page 320</u>		
\$8B	P2196	Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	0.85	1.15	Refer to DTC P2196 in the DTC summary table. = page 322		
Protected by Volkswagen AG.							
If any	- If any of the components or systems fail to meet the specified						

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - \Rightarrow "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 – Sensor 2

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$02".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$05	P013A	Deceleration Test – O2 Transient Time.	1,000.0 mV/s		Refer to DTC P013A in the DTC summary table. ⇒ page 201
\$92	P013B	Output Voltage Rich During Decel.	650 mV/ s		Refer to DTC P013B in the DTC summary table. ⇒ page 204
\$93	P013E	Output Voltage Lean During Accel.	0.0 s		Refer to DTC P013E in the DTC summary table. ⇒ page 207

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$94	P013F	Deceleration Test Response Time.	0.0 s	0.9 s	Refer to DTC P013F in the DTC summary table. ⇒ page 210
\$95	P2270	Oxygen Sensor Maximum Oscillation Voltage.	0.874 V	7.999 V	Refer to DTC P2270 in the DTC summary table. ⇒ page 337
\$96	P2271	Oxygen Sensor Minimum Oscillation Voltage.	0.0 V	0.249 V	Refer to DTC P2271 in the DTC summary table. ⇒ page 340

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory for stored DTCs or the corresponding diagnostic
- Switch the ignition off...

Monitor-ID \$21: Catalytic Converter Monitoring

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$21".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$84	P0420	Catalytic Converter Monitoring Bank 1.	0.0		Refer to DTC P0420 in the DTC summary table. page 263

- . SA NEW CONTRINUON VOIKSWAGBEN AG. If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure <u> "3.3.3 Diagnostic Mode 03 – Read DTC Memory</u> page 20 .
- Switch the ignition off.

Monitor-ID \$35: Camshaft Adjustment / IVVT Bank 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$35".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$80	P0011	V V T Specified Position Not Reached.	0.0° KW		Refer to DTC P0011 in the DTC summary table. ⇒ page 171
\$81	P000A	V V T Specified Position Is Reached Too Slow.	15.0°		Refer to DTC P000A in the DTC summary table. ⇒ page 169

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$3B: Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3B".

- Select the desired "Test-ID".
- Check specified values at idle.

Check	 Check specified values at idle. 					
Test-ID	DTC	Component or System	Min.	Max.	Additional Information	
\$87	P0442	Fuel Tank Leak Test: Long Cycle (Small Leak).	15.003 – 50.003 mA	255.996 mA	Refer to DTC P0442 the DTC summary table. ⇒ page 269	
\$88	P0442	Fuel Tank Leak Test: Short Cycle (Small Leak).	15.003 – 50.003 mA	255.996 mA	Refer to DTC P0442 the DTC summary table. ⇒ page 269	
 If any value ory to repair ⇒ "3.3 page Switc 	\$87 P0442 Fuel Tank Leak Test: Long Cycle (Small Leak). \$88 P0442 Fuel Tank Leak Test: Short Cycle (Small Leak). \$89 P0442 Fuel Tank Leak Test: Short Cycle (Small Leak). \$89 P0442 Fuel Tank Leak Test: Short Cycle (Small Leak). \$80 P0442 Fuel T					
Monitor-I (0.020" /	D \$3C; Fi 0.5 mm)	uel Tank EVAP System Integrity /	Leak Test		Oligi Wi	
- Conn	ect the sc	an tool.			Tres	
- Start	- Start the engine and run at idle.					
Selectionponer	 Select Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". 					
Select "N	Select "Monitor-ID \$3C".					
- Selec	- Select the desired "Test-ID".					
- Chec	- Check specified values at idle.					
Test-ID	DTC	Component or System	Min.	Max.	Additional Information	

Monitor-ID \$3C: Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$81	P0456	Tank Leak Test: Pinhole Leak (0.5 mm).	15.003 – 50.003 mA		Refer to DTC P0456 in the DTC summary table. ⇒ page 271

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

3.3.3 Diagnostic Mode 03 - Post 197

<u>page 20</u>.

Switch the ignition off.

Monitor-ID \$3D: EVAP Valve Function Check

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3D".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$8B	P0441	Tank Vent Valve Check From %		655.35	Refer to DTC P0441 in the DTC
		DTEV: Active Test Air Balance At	JUL GUARAN		summary table. <u>⇒ page 267</u>
		Idle Ok, (Normal Operation And	"Ian	* ©_	
	e guit	Short Test 70).		Ora	

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - page 20
- Switch the ignition off.

Monitor-ID \$41: Oxygen Sensor Heater Monitor Bank 1 – Sensor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$41".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min. Max.	Additional Information
\$85	P0135	Oxygen Sensor Ceramic Temp Bank 1 Sensor 1.	730.0° C 6,513.5° C	Refer to DTC P0135 in the DTC summary table. ⇒ page 199

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 – Sensor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$42".

- Select the desired "Test-ID".
- Check specified values at idle.

Chec	- Check specified values at idle.					
Test-ID	DTC	Component or System	Min.	Max.	Additional Information	
\$90	P0141	Oxygen Sensor Heating Between Catalytic Converter, Diagnosis, Bank 1 Sensor 2 Internal Resistance Test.	0.0 kΩ	0.70 kΩ	Refer to DTC P0141 in the DTC summary table. ⇒ page 212	
– If any	- If any of the components of systems fail to meet the specified					
ory to repair ⇒ "3.3	agnosis, Bank 1 Sensor 2 Internal Resistance Test. If any of the components of systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20 Switch the ignition off. Monitor-ID \$71 Secondary Air Injection System Connect the scan tool. Start the engine and run at idle.					
- Switc	h the ignit	tion off.			William	
Monitor-I	D \$71.8	econdary Air Injection System			espe	
- Conn	ect the sc	an tool.			ctto	
- Start	the engin	e and run at idle.			the co	
	 Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$71". Select the desired "Test-ID". Check specified values at idle. 					
Select "N	Select "Monitor-ID \$71".					
- Selec	- Select the desired "Test-ID".					
- Chec	- Check specified values at idle.					
Test-ID	DTC	Component or System	Min.	Max.	Additional Information	

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20 .
- Switch the ignition off.

Monitor-ID \$71 Secondary Air Injection System

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$71".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$82	P0491	Secondary Air Injection System Function Test.	0.031 V		Refer to DTC P0491 in the DTC summary table. ⇒ page 273
\$85	P0410	Secondary Air Injection Pressure Check	-32.768 kPa		Refer to DTC P0410 in the DTC summary table. ⇒ page 260
\$8C	P2440	Tightness Check Bank 1.	0.0	1.3 Kari	Refer to DTC P2440 in the DTC summary table. ⇒ page 354

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$A2: Mis-Fire Cylinder 1 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A2".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information		
\$0B	P0301	Misfire Cylinder 1, Average Value Over 10 Driving Cycles.	0.0 counts		Refer to DTC P0301 in the DTC summary table. ⇒ page 239		
\$0C		Misfire Cylinder 1, In This Driving Cycle.	0.0 counts	counts	Refer to DTC P0301 in the DTC summary table. ⇒ page 239		
If any of the compless or systems fail to most the appointed							

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - "3.33 Diagnostic Mode 03 Read DTC Memory", page 20 .
- Switch the ignition off.

Monitor-ID \$A3: Mis-Fire Cylinder 2 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A3".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information			
\$0B	P0302	Misfire Cylinder 2, Average Value Over 10 Driving Cycles.	0.0 counts		Refer to DTC P0302 in the DTC summary table. ⇒ page 240			
\$0C	.05	Misfire Cylinder 2, In This Driving Cycle.	0.0 counts		Refer to DTC P0302 in the DTC summary table. ⇒ page 240			
PA Naganesylo Voory								
If any	- If any of the components or systems fail to meet the specified							

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$A4: Mis-Fire Cylinder 3 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A4".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P0303	Misfire Cylinder 3, Average Value Over 10 Driving Cycles.	0.0 counts		Refer to DTC P0303 in the DTC summary table. ⇒ page 242
\$0C	P0303	Misfire Cylinder 3, In This Driving Cycle.	0.0 counts		Refer to DTC P0303 in the DTC summary table. ⇒ page 242

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory",
- Switch the ignition off.

page 20.

Monitor-ID \$A5: Mis-Fire Cylinder 4 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A5".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B		Misfire Cylinder 4, Average Value Over 10 Driving Cycles.	0.0 counts		Refer to DTC P0304 in the DTC summary table. ⇒ page 243
\$0C	P0304	Misfire Cylinder 4, In This Driving Cycle.	0.0 counts		Refer to DTC P0304 in the DTC summary table. ⇒ page 243

Read Test Reagnostic Functions,

Jesible to retrieve test results for ams which are continuously or not are diagnosis of a system is complete are corresponding thresholds are saved do. This data remains saved (even with ather new diagnostic results become availating a source of their scan tool. Depending on a data is provided to the individual aftermarket scan panies for development of their scan tool. Depending on a notol being used, the min & max values shown may vary, rounded up or down to the nearest decimal point depending the aftermarket scan tool company's development process.

For example; GST manual documentation will show the value as 0.3499 (units) while the scan tool will display the same value as 0.35 (units).

**Poending on the scan tool and protocol used, the information of the scan tool of the same value as 0.35 (units).

**Poending on the scan tool of may be referred to by differer such as Test-ID (TID). Hex-ID, Component-ID (CID)

**Years and the scan tool of may be referred to by differer such as Test-ID (TID). Hex-ID, Component-ID (CID)

**Years and the scan tool of may be referred to by differer such as Test-ID (TID). Hex-ID, component-ID (CID)

**Years and the scan tool of the scan tool of may be referred to by differer such as Test-ID (TID). Hex-ID, component-ID (CID)

**Years and Test-ID (TID). Hex-ID, component-ID (TID)

**Years and Test-ID (TID). Hex-ID, component-ID (TID)

**Years and Test-ID (TID). Hex-ID, component-ID (TID)

**Years and Test-I

Test requirements

- Exhaust system must be properly sealed between the catalytic converter and the cylinder heads.
- No DTCs stored in the DTC memory.
- Coolant temperature at least 80° C.

Work procedure

- Connect the scan tool.
- Start the engine and let run at idle speed.
- Select Mode 6: Check / test the results of components that are not continuously monitored.

Select the desired Test-ID.

The current minimum and maximum values will be displayed on the scan tool screen.

The following table is a numerical list of all "Test-IDs" that may be selected.

Monitor-ID (Hex-ID)	Component or System
\$01: <u>⇒ page 41</u>	Oxygen Sensor Monitor Bank 1 – Sensor 1
\$02: <u>⇒ page 42</u>	Oxygen Sensor Monitor Bank 1 – Sensor 2
\$21: <u>⇒ page 42</u>	Catalytic Converter Monitoring
\$21: <u>⇒ page 42</u> \$35: <u>⇒ page 43</u> \$3B: <u>⇒ page 43</u>	Camshaft Adjustment JVVT Bank 1
\$3B: ⇒ page 43 gauthorise 2	Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)
\$3C: <u>⇒ page 44</u>	Fuel Tank EVAP System Integrity Leak Test (0.020" / 0.5 mm)
\$3D: <u>⇒ page 44</u>	EVAP Valve Function Check
\$41: <u>** page 45</u>	Oxygen Sensor Heater Monitor Bank 1 Sensor 1
\$42. <mark>⇒ page 45</mark>	Oxygen Sensor Heater Monitor Bank 1 – Sensor 2
\$7 <u>⊈</u> : <u>⇒ page 46</u>	Secondary Air Injection System
\$A2: <u>⇒ page 46</u>	Mis-Fire Cylinder 1 Data
\$Ã3: <u>⇒ page 47</u>	Mis-Fire Cylinder 2 Data
\$Ā4: <u>⇒ page 47</u>	Mis-Fire Cylinder 3 Data
\$A5: <u>⇒ page 48</u>	Mis-Fire Cylinder 4 Data

Monitor-ID \$01: Oxygen Sensor Monitor Bank 1 - Sensor 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Protected by copyright, Co.

- Select the desired "Test-ID".
- Check specified values at idle.

	who page 40 who is the Cylinder 4 Data							
Monitor	Monitor-ID \$01: Oxygen Sensor Monitor Bank 1 – Sensor 1 - Connect the scan tool. - Start the engine and run at idle. - Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$01". - Select the desired "Test-ID". - Check specified values at idle. Tost DTC Component or System Min. Max. Additional Information							
– Con	- Connect the scan tool.							
- Star	- Start the engine and run at idle.							
	 Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". 							
Select "	Monitor-II	O \$01".		9	"eingo			
- Sele	ct the des	D \$01". Sired "Test-ID". ed values at idle.		2 2 1/57	110 Vydry			
- Che	ck specifie	ed values at idle.		. DA Napsivie				
Test- ID	DTC	Component or System	Min.	Max.	Additional Information			
\$83	P0133	Oxygen Sensor Signal Dynamic Bank 1 – Sensor 1.	0.0	1.0	Refer to DTC P0133 in the DTC summary table. ⇒ page 389			
\$86	P0133	Oxygen Sensor Signal Delay Bank 1 – Sensor 2.	0.0	1.0	Refer to DTC P0133 in the DTC summary table. ⇒ page 389			

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$8A	P2195	Oxygen Sensor Lean Fault Detection Bank 1 – Sensor 1.	0.850	1.150	Refer to DTC P2195 in the DTC summary table. ⇒ page 512
\$8A	P2195	Oxygen Sensor Lean Fault Detection Bank 1 – Sensor 1.	0.850	32.767	Refer to DTC P2195 in the DTC summary table. ⇒ page 512
\$8B	P2196	Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	0.850	1.150	Refer to DTC P2196 in the DTC summary table. ⇒ page 513
\$8B	P2196	Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	0.850	32.767	Refer to DTC P2196 in the DTC summary table. ⇒ page 513

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 – Sensor 2

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$02".

- Select the desired "Test-ID".
- Check specified values at idle NG. Volkswagen AG do

Test- ID	DTC	Component or System	Min. Pual	Max.	Additional Information
\$05	P013A	Oxygen Sensor Transient Time Rich-Lean Bank 1 – Sensor 2.	1,000.0 mV/s		Refer to DTC P013A in the DTC summary table. ⇒ page 396
\$92	P013B	Oxygen Sensor Transient Time Lean-Rich Bank 1 – Sensor 2.	650.0 mV/s		Refer to DTC P013B in the DTC summary table. ⇒ page 400
\$93	P013E	Oxygen Sensor Delay Time Rich- Lean Bank 1 – Sensor 2.	0.0 s	0.90 s	Refer to DTC P013E in the DTC summary table. ⇒ page 404
\$94 ^M ui	P013F	Oxygen Sensor Delay Time Lean-Rich Bank 1 – Sensor 2.	0.0 s	0.9 s	Refer to DTC P013F in the DTC summary table. ⇒ page 408
5 0 \$	P2270	Oxygen Sensor Maximum Oscillation Voltage Bank 1 – Sensor 2.	0.874 V	7.999 V	Refer to DTC P2270 in the DTC summary table. ⇒ page 527
\$ <u>9</u> 6	P2271	Oxygen Sensor Minimum Oscillation Voltage Bank 1 – Sensor 2.	0.0 V	0.249 V	Refer to DTC P2271 in the DTC summary table. ⇒ page 531

- .c C The mage of the thought of the If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory" page 20%
- Switch the ignition off.

Monitor-ID \$21: Catalytic Converter Monitoring

- Connect the scan tool $q_{p_{\partial j_{Q_0}}}$
- Start the engine and run at idle.

Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". ponents trial arc no. 2

lect "Monitor-ID \$21".

Select the desired "Test-ID", Volkswagen AG. Volkswagen AG does not guarantee of the second state of the second se

Select "Monitor-ID \$21".

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$84		Measured OSC Compared To OSC Of Borderline Catalyst Bank 1.	0.0		Refer to DTC P0420 in the DTC summary table. ⇒ page 460

Monitor-ID \$35: Camshaft Adjustment / VVT Bank 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$35"

- Select the desired "Test-ID" Application
- Check specified values at idle.



φ04	10420000	OSC Of Borderline Catalyst Bank 1.	0.0	0.999	summary table. ⇒ page 460			
	, i espec							
value ory t repa <u>⇒ "3</u>	If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.33 Diagnostic Mode 03 – Read DTC Memory", page 20. Switch the ignition off. Monitor-ID \$35: Camshaft Adjustment / VVT Bank 1 Connect the scan tool. Start the engine and run at idle. Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$35" Select the desired "Test-ID" Check specified values at idle. Test- DTC Component or System Min. Max. Additional Information							
- Swit	ch the ign	ition off.			of inf			
Monitor	-ID \$35: C	Camshaft Adjustment / VVT Bank 1	l V		orma,			
- Con	nect the s	can tool.			tioni			
- Start	t the engir	ne and run at idle.			This is			
		ostic Mode 06: Check / test the restree not continuously monitored".	sults of co	m-	ila liko			
Select "	Monitor-II	D \$35"	9	Sulde	50			
- Sele	- Select the desired "Test-ID" - Check specified values at idle. - Select the desired "Test-ID" - Select the desired "Test-ID"							
- Che	- Check specified values at idle.							
Test- ID	Test- DTC Component or System Min. Max. Additional Information							
\$80	P0011	Target Error Intake.	0.0°	9.0 – 10.0°	Refer to DTC P0011 in the DTC summary table. ⇒ page 367			
\$81	P000A	Slow Response Intake.	15.0°	655.35°	Refer to DTC P000A in the DTC summary table. page 365			

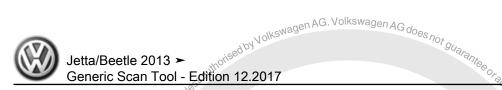
- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$3B: Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3B".

- Select the desired "Test-ID".
- Check specified values at idle.



Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$87	P0442	Rough Leak Long Cycle.	15.003 – 50.003 mA		Refer to DTC P0442 in the DTC summary table. page 467
\$88	P0442	Rough Leak Short Cycle.	15.003 – 50.003 mA	255.996 mA	Refer to DTC P0442 in the DTC summary table. ⇒ page 467

Monitor-ID \$3C: Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)

Select "Monitor-ID \$3C".

	art orig	50.003 mA	mA	summary table. ⇒ page 467				
du 'səs								
If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20 . Switch the ignition off. Monitor-ID \$3C: Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm) Connect the scan tool. Start the engine and run at idle. Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$3C". Select the desired "Test-ID". Check specified values at idle. Test- DTC Component or System Min. Max. Additional Information \$81 P0456 Small Leak 15 003 - 255 996 Refer to DTC P0456 in the DTC P0456 in								
 Switch the ig 	- Switch the ignition off							
Monitor-ID \$3C: Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)								
- Connect the	scan tool.		9	Collido				
 Start the eng 	ine and run at idle.		Olkan O	Veding.				
 Select "Diagram ponents that 	 Select "Diagnostic Mode 06: Check / test the results of companies that are not continuously monitored". 							
Select "Monitor-	ID \$3C".							
- Select the de	sired "Test-ID".							
- Check specif	Check specified values at idle.							
Test- DTC	Component or System	Min.	Max.	Additional Information				
\$81 P0456	Small Leak.	15.003 – 50.003 mA	255.996 mA	Refer to DTC P0456 in the DTC summary table. ⇒ page 469				

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", <u>page 20</u>.
- Switch the ignition off.

Monitor-ID \$3D: EVAP Valve Function Check

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 6: Check test the results of components that are not continuously monitored".

Select "Monitor-ID \$3D".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$8B	P0441	Purge Valve Functional Check.	0.05		Refer to DTC P0441 in the DTC summary table. ⇒ page 465

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", <u>page 20</u>.
- Switch the ignition off.

Monitor-ID \$41: Oxygen Sensor Heater Monitor Bank 1 – Sensor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$41".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$85		Oxygen Sensor Ceramic Temperature Bank 1 – Sensor 1.	730.0° C		Refer to DTC P0135 in the DTC summary table. ⇒ page 395

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - <u> "3.3.3 Diagnostic Mode 03 Read DTC Memory",</u> <u>page 20</u>
- Switch the ignition off.

Memory". Memory". Memory". AG. Volkswagen AG does not guarantee or acception of the control o Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 – Sensor

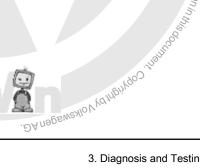
- Connect the scan tool.
- Start the engine and run at idle
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$42".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$90		Oxygen Sensor Internal Resistance Bank 1 & Sensor 2.	0.0 kΩ		Refer to DTC P0141 in the DTE summary table. ⇒ page 411

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - <u>"3.3.3 Diagnostic Mode 03 Read DTC Memory"</u> Protected by copyn <u>page 20</u> .
- Switch the ignition off.



Monitor-ID \$71: Secondary Air Injection System

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$71".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$82	P0491	Functional Check Blockage.	0.031	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 470
\$82	P0491	Functional Check Leakage.	0.031	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 470
\$82	P0491	Flow Check Blockage.	0.648	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 470
\$82	P0491	Flow Check Leakage.	0.507	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 470
\$85	P0410	Pressure Sensor Plausibility.	-32.768 kPa	5.0 kPa	Refer to DTC P0410 in the DTC summary table. ⇒ page 457
\$8C	P2440	Valve Tightness Check.	0.0 _{Wager}	AG1.296 ^{wa}	Refer to DTC P2440 in the DTC summary table. <u>⇒ page 551</u>

- If any of the components or systems fall to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20 .
- Switch the ignition off.

Monitor-ID \$A2: Mis-Fire Cylinder 1 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A2".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P0301	Cylinder 1 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts		Refer to DTC P0301 in the DTC summary table. page 438
\$0C	P0301	Cylinder 1 Data Current Driving Cycle, Only Indication (Pass).	0.0°		Refer to DTC P0301 in the DTC summary table. ⇒ page 438

 If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

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⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20.

Switch the ignition off.

Monitor-ID \$A3: Mis-Fire Cylinder 2 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A3".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.Volk	Max.	Additional Information
\$0B	P0302	Cylinder 2 Data Averaged During Last 10 Driving Cycles, Only indication (Pass).	0.0 counts		Refer to DTC P0302 in the DTC summary table. ⇒ page 440
\$0C	P0302	Cylinder 2 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts		Refer to DTC P0302 in the DTC summary table. ⇒ page 440

Monitor-ID \$A4: Mis-Fire Cylinder 3 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A4".

- Select the desired "Test-ID".
- Check specified values at idle.

		dication (Pass).			· Ph					
\$0C	P0302	Cylinder 2 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts	65,535.0 counts	Refer to DTC P0302 in the DTC summary table. ⇒ page 440					
\$0C P0302 Cylinder 2 Data Current Driving Cycle, Only Indication (Pass). - If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure - 3.3.3 Diagnostic Mode 03 - Read DTC Memory", page 20. - Switch the ignition off. Monitor-ID \$A4: Mis-Fire Cylinder 3 Data - Connect the scan tool. - Start the engine and run at idle. - Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$A4". - Select the desired "Test-ID". - Check specified values at idle. Test- DTC Component or System Min. Max. Additional Information										
Monitor-ID \$A4: Mis-Fire Cylinder 3 Data										
– Con	nect the s	scan tool.								
– Star	t the engir	ne and run at idle.								
- Sele	ect "Diagno ents that a	ostic Mode 06: Check / test the resare not continuously monitored".	ults of com	1-	nund of the state					
Select "	"Monitor-I	D \$A4".			out. Cot.					
- Select the desired "Test-ID".										
- Select the desired "Test-ID". - Check specified values at idle.										
Test- DTC Component or System Min. Max. Additional Information										
\$0B	P0303	Cylinder 3 Data Averaged During Last 10 Driving Cycles, Only In- dication (Pass).	0.0 counts	65,535.0 counts	Refer to DTC P0303 in the DTC summary table. ⇒ page 442					
\$0C	P0303	Cylinder 3 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts	65,535.0 counts	Refer to DTC P0303 in the DTC summary table. ⇒ page 442					

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20.

Switch the ignition off.

Monitor-ID \$A5: Mis-Fire Cylinder 4 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A5".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P0304	Cylinder 4 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts		Refer to DTC P0304 in the DTC summary table. ⇒ page 444
\$0C	P0304	Cylinder 4 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts		Refer to DTC P0304 in the DTC summary table. ⇒ page 444

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Diagnostic Mode 06 - Read Test Re-3.3.9 sults for Specific Diagnostic Functions, 2017 MY

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Diagnostic Mode 06 makes it possible to retrieve test results for special components and systems which are continuously or not continuously monitored. If the diagnosis of a system is complete, the diagnostic result and the corresponding thresholds are saved and displayed in mode 06. This data remains saved (even with the ignition off) until either new diagnostic results become available or the DTC memory is erased.

The min & max values for each individual test in Mode 06 represent the min & max operating values for a properly operating system. This data is provided to the individual aftermarket scan tool companies for development of their scan tool. Depending on the scan tool being used, the min & max values shown may vary, or be rounded up or down to the nearest decimal point depending on the aftermarket scan tool company's development process.

For example; GST manual documentation will show the value as 0.3499 (units) while the scan tool will display the same value as 0.35 (units).

Depending on the scan tool and protocol used, the information displayed in Diagnostic Mode 06 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), On-38WeAllo Vedragingoo Board Diagnostic Monitor Identifier (OBDMID), or contain no name at all and may be referenced by only a number.

Test requirements

- Exhaust system must be properly sealed between the catalytic converter and the cylinder heads.
- No DTCs stored in the DTC memory.
- Coolant temperature at least 80° C.

Work procedure

- Connect the scan tool.
- Start the engine and let run at idle speed.
- Select Mode 6: Check / test the results of components that are not continuously monitored.

Select the desired Test-ID.

The current minimum and maximum values will be displayed on the scan tool screen.

The following table is a numerical list of all "Test-IDs" that may be selected.

Monitor-ID (Hex-ID)	Component or System
\$01: <u>⇒ page 49</u>	Oxygen Sensor Monitor Bank 1 – Sensor 1
\$02: <u>⇒ page 50</u>	Oxygen Sensor Monitor Bank 1 – Sensor 2
\$21: <u>⇒ page 50</u>	Catalytic Converter Monitoring
*\$\frac{1}{2}\$\infty\$ \$35: \$\Rightarrow\$ page 51	Camshaft Adjustment / V V T Bank 1
*************************************	Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)
\$3C: <u>⇒ page 52</u>	Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)
\$3D: <u>⇒ page 52</u>	EVAP Valve Function Check
\$41: <u>⇒ page 53</u>	Oxygen Sensor Heater Monitor Bank 1 – Sensor 1
\$42: <u>⇒ page 53</u>	Oxygen Sensor Heater Monitor Bank 1 – Sensor 2
\$71: <u>⇒ page 53</u>	Secondary Air Injection System
\$A2: <u>⇒ page 54</u>	Mis-Fire Cylinder 1 Data
\$A3: <u>⇒ page 54</u>	Mis-Fire Cylinder 2 Data
\$A4: <u>⇒ page 55</u>	Mis-Fire Cylinder 3 Data
\$A5: <u>⇒ page 55</u>	Mis-Fire Cylinder 4 Data

Monitor-ID \$01: Oxygen Sensor Monitor Bank 1 - Sensor 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$01".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$83	P0133	Oxygen Sensor Signal Dynamic Bank 1 – Sensor 1.	0.0	1.0	Refer to DTC P0133 in the DTC summary table. ⇒ page 586
\$86	P0133	Oxygen Sensor Signal Delay Bank 1 – Sensor 2.	0.0	1.0	Refer to DTC P0133 in the DTC summary table. ⇒ page 586
\$8A	P2195	Oxygen Sensor Lean Fault Detection Bank 1 – Sensor 1.	0.850	1.150	Refer to DTC P2195 in the DTC summary table. ⇒ page 717
\$8A	P2195	Oxygen Sensor Lean Fault Detection Bank 1 – Sensor 1.	0.850	32.767	Refer to DTC P2195 in the DTC summary table. ⇒ page 717
\$8B	P2196	Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	0.850	1.150	Refer to DTC P2196 in the DTC summary table. ⇒ page 718



Test- ID	DTChor	Component or System	Min?	Max.	Additional Information
\$8B		Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	0.850		Refer to DTC P2196 in the DTC summary table. ⇒ page 718

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 – Sensor 2

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$02".

- Select the desired "Test-ID".
- Check specified values at idle.



3	P2196	Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	0.850	32.767	Refer to DTC P2196 in the DTC summary table. ⇒ page 718				
notpern	tection Bank 1 – Sensor 1. If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure 3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20 . Switch the ignition off. Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 – Sensor 2 Connect the scan tool. Start the engine and run at idle. Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$02". Select the desired "Test-ID". Check specified values at idle. Test- DTC Component or System Min. Max. Additional Information								
- All authorized in part orin whole bad	ies, refer to to check fo air procedu 3.3.3 Diagr e 20	nostic Mode 03 – Read DTC Memo	the specific g Fault Merng diagnos	ed m- tic	respect to the corre				
SC	tch the ign				ctnes				
2	nect the s	Oxygen Sensor Monitor Bank 1 – S can tool	ensor 2		S of ir				
2		ne and run at idle.		å	lform-				
– Sele	ect "Diagno	ostic Mode 06: Check / test the res	sults of com	1- (10)					
. %		re not continuously monitored".		this oc					
Select	Select "Monitor-ID \$02".								
Sala	ant the dec	ired "Test ID"		11012					
	.00	ed values at idle.	ca jubindo	rigur.					
	.00		Min.	Max.	Additional Information				
- Che	ck specifie	ed values at idle.	1,000.0 mV/s	Max. 65,534.0 mV/s	Additional Information Refer to DTC P013A in the DTC summary table. page 593				
- Che	DTC	Component or System Oxygen Sensor Transient Time	1,000.0	65,534.0	Refer to DTC P013A in the DTC				
- Che Test- ID \$05	DTC P013A	Oxygen Sensor Transient Time Rich – Lean Bank 1 – Sensor 2. Oxygen Sensor Transient Time Rich – Lean Bank 1 – Sensor 2.	1,000.0 mV/s 650.0	65,534.0 mV/s 65,534.0	Refer to DTC P013A in the DTC summary table. ⇒ page 593 Refer to DTC P013B in the DTC				
- Che Test- ID \$05 \$92	DTC P013A P013B	Oxygen Sensor Transient Time Rich – Lean Bank 1 – Sensor 2. Oxygen Sensor Transient Time Lean – Rich Bank 1 – Sensor 2. Oxygen Sensor Delay Time Rich	1,000.0 mV/s 650.0 mV/s	65,534.0 mV/s 65,534.0 mV/s	Refer to DTC P013A in the DTC summary table. ⇒ page 593 Refer to DTC P013B in the DTC summary table. ⇒ page 597 Refer to DTC P013E in the DTC				
- Che Test- ID \$05 \$92 \$93	DTC P013A P013B P013E	Oxygen Sensor Transient Time Rich – Lean Bank 1 – Sensor 2. Oxygen Sensor Transient Time Lean – Rich Bank 1 – Sensor 2. Oxygen Sensor Delay Time Rich – Lean Bank 1 – Sensor 2. Oxygen Sensor Delay Time Rich – Lean Bank 1 – Sensor 2.	1,000.0 mV/s 650.0 mV/s 0.0 s	65,534.0 mV/s 65,534.0 mV/s 0.9 s	Refer to DTC P013A in the DTC summary table. ⇒ page 593 Refer to DTC P013B in the DTC summary table. ⇒ page 597 Refer to DTC P013E in the DTC summary table. ⇒ page 601 Refer to DTC P013F in the DTC				
- Che Test- ID \$05 \$92 \$93 \$94	P013A P013B P013E P013F	Oxygen Sensor Transient Time Rich – Lean Bank 1 – Sensor 2. Oxygen Sensor Delay Time Rich – Lean Bank 1 – Sensor 2. Oxygen Sensor Delay Time Rich – Lean Bank 1 – Sensor 2. Oxygen Sensor Delay Time Lean – Rich Bank 1 – Sensor 2. Oxygen Sensor Delay Time Lean – Rich Bank 1 – Sensor 2. Oxygen Sensor Maximum Oscil-	1,000.0 mV/s 650.0 mV/s 0.0 s	65,534.0 mV/s 65,534.0 mV/s 0.9 s	Refer to DTC P013A in the DTC summary table. ⇒ page 593 Refer to DTC P013B in the DTC summary table. ⇒ page 597 Refer to DTC P013E in the DTC summary table. ⇒ page 601 Refer to DTC P013F in the DTC summary table. ⇒ page 605 Refer to DTC P2270 in the DTC				

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$21: Catalytic Converter Monitoring

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$21".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$84		Measured OSC Compared To OSC Of Borderline Catalyst Bank 1.	0.0		Refer to DTC P0420 in the DTC summary table. ⇒ page 663

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic
 - repair procedure

 ⇒ "3.3.3 Diagnostic Mode" 03 Read DTC Memory" not guarantee or
- Switch the ignition off.

Monitor-ID \$35: Camshaft Adjustment / V V T Bank 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$35".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$80	P0011	Target Error Intake.	0.0°		Refer to DTC P0011 in the DTC summary table. ⇒ page 562
\$81	P000A	Slow Response Intake.	15.0°		Refer to DTC P000A in the DTC summary table. ⇒ page 560

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure "3.3.3 Diagnostic Mode 03 – Read DTC Memory" NOT Protec . DA nage page 20.
- Switch the ignition off.

Monitor-ID \$3B: Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3B".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$87	P0442	Rough Leak Long Cycle.	15.003 – 50.003 mA	255.996 mA	Refer to DTC P0442 in the DTC summary table. ⇒ page 670
\$88	P0442	Rough Leak Short Cycle.	15.003 – 50.003 mA	255.996 mA	Refer to DTC P0442 in the DTC summary table. ⇒ page 670

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", <u>page 20</u>.
- Switch the ignition off.

Monitor-ID \$3C: Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3C".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$81	P0456	Small Leak.	15.003 – 50.003 mA		Refer to DTC P0456 in the DTC summary table. ⇒ page 672

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic e 03 – Read DTC IVIC.

 e 04 – Read DTC IVIC.

 e 05 – Read DTC IVIC.

 e 06 – Read DTC IVIC.

 e 07 – Read DTC IVIC.

 e 08 – Read DTC IVIC.

 e 08 – Read DTC IVIC.

 e 09 – Read DTC IVIC. repair procedure
 - 3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$3D: EVAP Valve Function Check

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3D".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$8B	P0441	Purge Valve Functional Check.	0.05		Refer to DTC P0441 in the DTC summary table. ⇒ page 668

- West Copyright Copyright William Copyright Cop If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - '3.3.3 Diagnostic Mode 03 Read DTC Memory", <u>page 20</u>.
- Switch the ignition off. d by copyright



Monitor-ID \$41: Oxygen Sensor Heater Monitor Bank 1 – Sensor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$41".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$85		Oxygen Sensor Ceramic Temperature Bank 1 – Sensor 1.	730.0° C		Refer to DTC P0135 in the DTC summary table. ⇒ page 592

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - 3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 - Sensor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$42".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$90	P0141	Oxygen Sensor Internal Resistance Bank 1 – Sensor 2.	0.0 kΩ		Refer to DTC P0141 in the DTC summary table. ⇒ page 608

- J. Leanlts of C. If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - '3.33 Diagnostic Mode 03 Read DTC Memory",
- Switch the ignition off.

Monitor-ID \$71: Secondary Air Injection System

- Connect the scan tool
- Start the engine and run at idle
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$71".

Select the desired "Test-ID".

Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$82	P0491	Functional Check Blockage.	0.031	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 673
\$82	P0491	Functional Check Leakage.	0.031	1.999	Refer to DTC P0491 in the DTC summary table. <u>⇒ page 673</u>
\$82	P0491	Flow Check Blockage.	0.507	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 673
\$82	P0491	Flow Check Leakage.	0.507	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 673
\$85	P0410	Pressure Sensor Plausibility.	-32.768 kPa	5.0 kPa	Refer to DTC P0410 in the DTC summary table. ⇒ page 660
\$8C	P2440	Valve Tightness Check.	0.0	Jolkswage	Refer to DTG P2440 in the DTC summary table. > page 757
			authoris	sqp)	guarantee or a

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - '3.3.3 Diagnostic Mode 03 Read DTC Memory", <u>page 20</u>.
- Switch the ignition off.

Monitor-ID \$A2: Mis-Fire Cylinder 1 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A2".

- Select the desired "Test-ID".
- Check specified values at idle.

φου	P0410	Pressure Sensor Plausibility.	-32.766 kPa	5.0 KPa	summary table. <u>> page 660</u>					
\$8C	P2440	Valve Tightness Check.	0.0	1.499	Refer to DTG R2440 in the DTC summary table. ⇒ page 757					
value ory to repai ⇒ "3∴ page	If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20 Switch the ignition off. Monitor-ID \$A2: Mis-Fire Cylinder 1 Data Connect the scan tool. Start the engine and run at idle. Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$A2". Select the desired "Test-ID". Check specified values at idle. Test-ID DTC Component or System Min. Max. Additional Information Sobre P0301 Cylinder 1 Data Averaged During Last 10 Driving Cycles, Only Indicating (Data 10 Driving Cycles, Only Indicating									
Monitor-	ID \$A2: M	is-Fire Cylinder 1 Data			cttot					
- Conn	ect the sc	an tool.			neco					
Start	the engine	e and run at idle.			orrect					
		stic Mode 06: Check / test the res e not continuously monitored".	ults of cor	n-	ness of					
Select "N	Monitor-ID	\$A2".			infon					
- Selec	ct the desi	red "Test-ID".			matio					
- Chec	k specifie	d values at idle.			n _{in th}					
Test-ID	DTC	Component or System	Min.	Max.	Additional Information					
\$0B	P0301	Cylinder 1 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts	65,535 counts	Refer to DTC P0301 in the DTC summary table. ⇒ page 637					
\$0C	P0301	Cylinder 1 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts	65,535 counts	Refer to DTC P0301 in the DTC summary table, page 637					

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$A3: Mis-Fire Cylinder 2 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A3".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P0302	Cylinder 2 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts		Refer to DTC P0302 in the DTC summary table. ⇒ page 638
\$0C	P0302	Cylinder 2 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts		Refer to DTC P0302 in the DTC summary table. ⇒ page 638

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20 .
- Switch the ignition off.

Monitor-ID \$A4: Mis-Fire Cylinder 3 Data

- Connect the scan tool.
- Start the engine and run at idle kswagen AG does
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A4".

- Select the desired "Test-ID".
- Check specified values at idle.

	DTC	Component or System	Min.	Max.	Additional Information	
\$0B	P0303	Cylinder 3 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts	65,535 counts	Refer to DTC P0303 in the DTC summary table. ⇒ page 640	
\$0C	P0303	Cylinder 3 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts	65,535 counts	Refer to DTC P0303 in the DTC summary table. ⇒ page 640	
SOC P0303 Cylinder 3 Data Averaged Dullindication (Pass). \$0C P0303 Cylinder 3 Data Current Driving Cycles, Only Indication (Pass). Cycle, Only Indication (Pass). Counts Summary table. ⇒ page 640 Refer to DTC P0303 in the DTC posos						

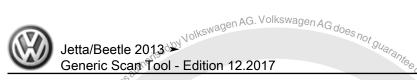
- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
- "3.3.3 Diagnostic Mode 03 Read DTC Memory" <u>page 20</u> .
- Switch the ignition off.

Monitor-ID \$A5: Mis-Fire Cylinder 4 Data

- Connect the scan tool.
- Start the engine and run at idle.
- he he Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A5".

- Select the desired "Test-ID".
- Check specified values at idle.



		0,5		-0-					
Test-ID	DTC	Component or System	Min.	Max.	Additional Information				
\$0B	P0304	Cylinder 4 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts	65,535 counts	Refer to DTC P0304 in the DTC summary table. ⇒ page 642				
\$0C	P0304	Cylinder 4 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts	65,535 counts	Refer to DTC P0304 in the DTC summary table. ⇒ page 642				
value ory to repair ⇒ "3.5 page	- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic								
repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20. - Switch the ignition off. 3.3.10 Diagnostic Mode 06 – Read Test Results for Specific Diagnostic Functions, 2018 MY Diagnostic Mode 06 makes it possible to retrieve test results for special components and systems which are continuously or not continuously monitored. If the diagnosis of a system is complete.									
special c	omponen	of makes it possible to retrieve te ts and systems which are continu	ously or no	or Odyngiydo					

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

3.3.10 Diagnostic Mode 06 – Read Test Results for Specific Diagnostic Functions, 2018 MY

continuously monitored. If the diagnosis of a system is complete, the diagnostic result and the corresponding thresholds are the diagnose of a system is complete. the ignition off) until either new diagnostic results become available or the DTC memory is erased.

The min & max values for each individual test in Mode 06 represent the min & max operating values for a properly operating system. This data is provided to the individual aftermarket scan tool companies for development of their scan tool. Depending on the scan tool being used, the min & max values shown may vary, or be rounded up or down to the nearest decimal point depending on the aftermarket scan tool company's development process.

For example: GST manual documentation will show the value as 0.3499 (units) while the scan tool will display the same value as 0.35 (units).

Depending on the scan tool and protocol used, the information displayed in Diagnostic Mode 06 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), On-Board Diagnostic Monitor Identifier (OBDMID), or contain no name at all and may be referenced by only a number.

Test requirements

- Exhaust system must be properly sealed between the catalytic converter and the cylinder heads.
- No DTCs stored in the DTC memory.
- Coolant temperature at least 80° C.

Work procedure

- Connect the scan tool.
- Start the engine and let run at idle speed.
- Select Mode 6: Check / test the results of components that are not continuously monitored.

Select the desired Test-ID.

The current minimum and maximum values will be displayed on the scan tool screen.

The following table is a numerical list of all "Test-IDs" that may be selected.

Monitor-ID (Hex-ID)	Component or System
\$01: <u>⇒ page 57</u>	Oxygen Sensor Monitor Bank 1 – Sensor 1
\$02: <u>⇒ page 58</u>	Oxygen Sensor Monitor Bank 1 – Sensor 2
\$21: <u>⇒ page 58</u>	Catalytic Converter Monitoring
\$35: <u>⇒ page 59</u>	Camshaft Adjustment / VVT Bank 1
\$3B: <u>⇒ page 59</u>	Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)
\$3C: <u>⇒ page 59</u>	Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)
\$3D: <u>⇒ page 60</u>	EVAP Valve Function Check
\$41: <u>⇒ page 60</u>	Oxygen Sensor Heater Monitor Bank 1 - Sensor 1
\$42: <u>⇒ page 61</u>	Oxygen Sensor Heater Monitor Bank 1 Sensor 2
\$71: <u>⇒ page 61</u>	Secondary Air Injection System
\$A2: <u>⇒ page 62</u>	Mis-Fire Cylinder 1 Data
\$A3: <u>⇒ page 62</u>	Mis-Fire Cylinder 2 Data
\$A4: <u>⇒ page 63</u>	Mis-Fire Cylinder 3 Data
\$A5: <u>⇒ page 63</u>	Mis-Fire Cylinder 4 Data

Monitor-ID \$01: Oxygen Sensor Monitor Bank 1 - Sensor 1

- Connect the scan tool.
- Start the engine and run at idle
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$01".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$83	P0133	Oxygen Sensor Signal Dynamic Bank 1 – Sensor 1.	0.0	1.0	Refer to DTC P0133 in the DTC summary table, page 792
\$86	P0133	Oxygen Sensor Signal Delay Bank 1 – Sensor 2.	0.000	1.0	Refer to DTC P0133 in the DTC summary table. ⇒ page 792
\$8A	P2195	Oxygen Sensor Lean Fault Detection Bank 1 – Sensor 1.	0.850	1.150	Refer to DTC P2195 in the DTC summary table. ⇒ page 919
\$8A	P2195	Oxygen Sensor Lean Fault Detection Bank 1 – Sensor 1.	0.850	32.767	Refer to DTC P2195 in the DTC summary table. ⇒ page 919
\$8B	P2196	Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	0.850	1.150	Refer to DTC P2196 in the DTC summary table. ⇒ page 921
\$8B	P2196	Oxygen Sensor Rich Fault Detection Bank 1 – Sensor 1.	0.850	32.767	Refer to DTC P2196 in the DTC summary table. ⇒ page 921

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic

espect to the correctness of informati

repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", <u>page 20</u> .

Switch the ignition off.

Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 – Sensor 2

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$02".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$05	P013A	Oxygen Sensor Transient Time Rich – Lean Bank 1 – Sensor 2.	1,000.0 mV/s	65,534.0 mV/s	Refer to DTC P013A in the DTC summary table. ⇒ page 799
\$92	P013B	Oxygen Sensor Transient Time Lean – Rich Bank 1 – Sensor 2.	650.0 do mV/s	65,534.0 mV/s	Refer to DTC P013B in the DTC summary table. ⇒ page 803
\$93	P013E	Oxygen Sensor Delay Time Rich – Lean Bank 1 – Sensor 2.	0.0 s	0.9 s	Refer to DTC P013E in the DTC summary table. ⇒ page 807
\$94	P013F	Oxygen Sensor Delay Time Lean Rich Bank 1 – Sensor 2.	0.0 s	0.9 s	Refer to DTC P013F in the DTC summary table. ⇒ page 811
\$95	P2270	Oxygen Sensor Maximum Oscillation Voltage Bank 1 – Sensor 2.	0.874 V	7.999 V	Refer to DTC P2270 in the DTC summary table. ⇒ page 936
\$96	P2271	Oxygen Sensor Minimum Oscillation Voltage Bank 1 – Sensor 2.	0.0 V	0.249 V	Refer to DTC P2271 in the DTC summary table. ⇒ page 940

Monitor-ID \$21: Catalytic Converter Monitoring

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$21".

- Select the desired "Test-ID".
- Check specified values at idle.

	471					
\$96		Oxygen Sensor Minimum Oscillation Voltage Bank 1 – Sensor 2.	0.0 V	0.249 V	Refer to DTC P2271 in the DTC summary table. ⇒ page 940	
- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20 . Switch the ignition off. Monitor-ID \$21: Catalytic Converter Monitoring - Connect the scan tool. Start the engine and run at idle. Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$21". Select the desired "Test-ID".						
– Conn	ect the sc	an tool.				
Start	the engine	e and run at idle.			auro	
Selectionpone	ct "Diagnos nts that ar	stic Mode 06: Check / test the rese not continuously monitored".	sults of com	1-	go.	
Select "N	Monitor-ID	\$21". red "Test-ID".	- Ex	WeXIIO VOX		
- Selec	t the desi	red "Test-ID".	. ĐA n _{ĐĐ}	,·		
- Chec	k specifie	d values at idle.				
Test-ID	DTC	Component or System	Min.	Max.	Additional Information	
\$84	P0420	Measured OSC Compared To OSC Of Borderline Catalyst Bank 1.	0.0	0.999	Refer to DTC P0420 in the DTC summary table. ⇒ page 867	

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20.

Switch the ignition off.

Monitor-ID \$35: Camshaft Adjustment / VVT Bank 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$35".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$80	P0011	Target Error Intake.	0.0°		Refer to DTC P0011 in the DTC summary table. ⇒ page 768
\$81	P000A	Slow Response Intake.	15.0°	n / 655 ′.3 5 °Wa	Refer to DTC P000A in the DTC summary table. ⇒ page 766
		authorise	9,04		Guarantee or

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$3B: Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3B".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$87	P0442	Rough Leak Long Cycle. 100, 140,	15.003 – 50.003 ₀₀₀ mA	255.996 mA	Refer to DTC P0442 in the DTC summary table. page 874
\$88	P0442	Rough Leak Short Cycle.	15.003 = 50.003 mA		Refer to DTC P0442 in the DTC summary table. ⇒ page 874

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - \Rightarrow "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$3C: Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)

Connect the scan tool.

- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3C".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$81	P0456	Small Leak.	15.003 – 50.003 mA		Refer to DTC P0456 in the DTC summary table. ⇒ page 875

If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory",

page 20.

Switch the ignition off.

Monitor-ID \$3D: EVAP Valve Function Check

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3D".

- Select the desired "Test-ID".
- Check specified values at idle.

 Select the desired "Test-ID". 			16	vagen AG does not	
 Check specified values at idle. 			cedpy Nolkswa	39	adoes not guara
Test-ID	DTC	Component or System 300	Min.	Max.	Additional Information
					U _A

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$41: Oxygen Sensor Heater Monitor Bank 1 - Sensor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check test the results of components that are not continuously monitored". Mardo Bringgo Homedo Yd beloeford

Select "Monitor-ID \$41".

- Select the desired "Test-ID".
- Check specified values at idle.



Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$85		Oxygen Sensor Ceramic Temperature Bank 1 – Sensor 1.	730.0° C		Refer to DTC P0135 in the DTC summary table. ⇒ page 798

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 – Sensor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$42".

- Select the desired "Test-ID".
- Check specified values at idle.

	\$85	P0135	Oxygen Sensor Ceramic Temperature Bank 1 – Sensor 1.	730.0° C	6,513.5° C	Refer to DTC P0135 in the DTC summary table. ⇒ page 798		
_	Seed to DTC P0135 in the DTC summary table. ⇒ page 798 If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure Solect "Diagnostic Mode 03 – Read DTC Memory", page 20. Switch the ignition off. Connect the scan tool. Start the engine and run at idle. Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$42". Select the desired "Test-ID". Check specified values at idle. Test-ID DTC Component or System Min. Max. Additional Information \$90 P0141 Oxygen Sensor Internal Resist: 0.0 kΩ 0.70 kΩ Refer to DTC P0141 in the DTC summary table. ⇒ page 814 If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03 - Read DTC Memory". Select "Solect To Diagnostic Mode 03 - Read DTC Memory". Solect Thought DTC Component or System Min. Max. Additional Information \$90 P0141 Oxygen Sensor Internal Resist: 0.0 kΩ 0.70 kΩ Refer to DTC P0141 in the DTC summary table. ⇒ page 814 If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure "3.3.3 Diagnostic Mode 03 - Read DTC Memory". Switch the ignition off. Monitor-ID \$71: Secondary Air Injection System Connect the scan tool.							
-	Switc	h the ignit	ion off.					
M 2	onitor-l	ID \$42: Ox	kygen Sensor Heater Monitor Bar	nk 1 – Sens	or			
_	Conn	ect the sc	an tool.	Jolks	lagen AG. Volks	swagen AG does not		
_	Start	the engine	e and run at idle.	rised by V		TOT 9Uaranto		
-	Selec poner	et "Diagnos nts that ar	stic Mode 06: Check / test the rese not continuously monitored".	sults of com	1-	SC OF BCC BUT.		
Se	elect "N	/lonitor-ID	\$42".			871 lije		
_	Selec	t the desi	red "Test-ID".					
_	Chec	k specified	d values at idle.			Jith res		
T	est-ID	DTC	Component or System	Min.	Max.	Additional Information		
	\$90	P0141	Oxygen Sensor Internal Resist-	0.0 kΩ	0.70 kΩ	Refer to DTC P0141 in the DTC		
			ance Bank 1 – Sensor 2.			summary table. <u>⇒ page 814</u>		
_	If any value ory to repair ⇒ "3.3 page	of the cors, refer to check for procedur 3.3 Diagno 20.	mponents or systems fail to meet Diagnostic Mode 03: Interrogating stored DTCs or the corresponding estic Mode 03 – Read DTC Memoration off.	the specific g Fault Mer ng diagnosi ory",	ed n- tic	summary table. ⇒ page 814 ecorrectness of information in this contract the second se		
_ _ _ M	If any value ory to repair ⇒ "3.3 page Switcle	of the cors, refer to check for procedur 3.3 Diagno 20. h the ignit	mponents or systems fail to meet Diagnostic Mode 03: Interrogating stored DTCs or the corresponding ostic Mode 03 – Read DTC Memoritation off.	the specific g Fault Mer ng diagnosi ory",	ed n- tic	summary table. ⇒ page 814 ecorrectness of information in the land of the lan		
_ _ _ M	If any value ory to repair ⇒ "3.3 page Switch onitor-I	of the cors, refer to check for procedur 3.3 Diagno 20. h the ignit	mponents or systems fail to meet Diagnostic Mode 03: Interrogating stored DTCs or the corresponding estic Mode 03 – Read DTC Memoritation off.	the specific g Fault Mer ng diagnos ory",	ed n- tic	summary table. ⇒ page 814 ecorrectness of information informatio		
_ _ M _	If any value ory to repair ⇒ "3.3 page Switch Connection Start for the second start for the	of the cors, refer to check for procedur 3.3 Diagno 20. h the ignit ID \$71: Seect the sc	mponents or systems fail to meet Diagnostic Mode 03: Interrogating stored DTCs or the corresponding estic Mode 03 – Read DTC Memorion off. econdary Air Injection System an tool. e and run at idle.	the specific g Fault Merng diagnost	ed m-tic	summary table. ⇒ page 814 Pecorrectness of information informati		
_ _ M _ _	Selec	t "Diagnos	mponents or systems fail to meet Diagnostic Mode 03: Interrogating stored DTCs or the corresponding estic Mode 03 – Read DTC Memoration off. econdary Air Injection System an tool. e and run at idle. stic Mode 06: Check / test the rese not continuously monitored".	the specific g Fault Mer ng diagnost ory",	ed n- tic	Summary table. ⇒ page 814 Page 814 Page 814 Page 814		
-	Selec poner	t "Diagnos	stic Mode 06: Check / test the res e not continuously monitored".	the specific g Fault Mer ng diagnost ory",	ed m-tic	summary table. ⇒ page 814 Pecorrectness of information informati		
-	Selec poner elect "M	et "Diagnos nts that ar Monitor-ID	stic Mode 06: Check / test the res e not continuously monitored".	the specific g Fault Mer ng diagnosi ory".	ed n- tic	summary table. ⇒ page 814 Page 814 Page 814 Page 814		
-	Selec poner elect "M Selec Checl	et "Diagnos nts that ar Monitor-ID et the desi	stic Mode 06: Check / test the rese not continuously monitored". \$71".	the specific g Fault Mer ng diagnosi ory",	ed n-tic	summary table. ⇒ page 814 Page 814 Page 814 Page 814		

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory",
 - page 20
- Switch the ignition off.

Monitor-ID \$71: Secondary Air Injection System

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of comercial ponents that are not continuously monitored".

Select "Monitor-ID \$71".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$82	P0491	Functional Check Blockage.	0.031	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 877
\$82	P0491	Functional Check Leakage.	0.031	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 877
\$82	P0491	Flow Check Blockage.	0.507	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 877
\$82	P0491	Flow Check Leakage.	0.507	1.999	Refer to DTC P0491 in the DTC summary table. ⇒ page 877



Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$85	P0410	Pressure Sensor Plausibility.	-32.768 kPa		Refer to DTC P0410 in the DTC summary table. ⇒ page 864
\$8C	P2440	Valve Tightness Check.	0.0		Refer to DTC P2440 in the DTC summary table. ⇒ page 960

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 3.3.2 Diagnostic Mode 03 Read DTC Memory
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20.
- Switch the ignition off.

Monitor-ID \$A2: Mis-Fire Cylinder 1 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A2".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P0301	Cylinder 1 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts AG. Volksw	counts	Refer to DTC P0301 in the DTC summary table. ⇒ page 842
\$0C	P0301	Cylinder 1 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts		Refer to DTC P0301 in the DTC summary table. ⇒ page 842

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory".
- Switch the ignition off.

Monitor-ID \$A3: Mis-Fire Cylinder 2 Data

- Connect the scantool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A3"

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P0302	Cylinder 2 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts		Refer to DTC P0302 in the DTC summary table. ⇒ page 844
\$0C	P0302	Cylinder 2 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts		Refer to DTC P0302 in the DTC summary table. ⇒ page 844

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 - ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 20
- Switch the ignition off.

Monitor-ID \$A4: Mis-Fire Cylinder 3 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A4".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P0303	Cylinder 3 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts		Refer to DTC P0303 in the DTC summary table. ⇒ page 846
\$0C	P0303	Cylinder 3 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts		Refer to DTC P0303 in the DTC summary table. ⇒ page 846

- If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure
 3.3.3 Diagnostic Mode 03 Read DTC Memory, page 20
- Switch the ignition off.

Monitor-ID \$A5: Mis-Fire Cylinder 4 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A5".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P0304	Cylinder 4 Data Averaged During Last 10 Driving Cycles, Only Indication (Pass).	0.0 counts	65,535 counts	Refer to DTC P0304 in the DTC summary table. ⇒ page 848
\$0C	P0304	Cylinder 4 Data Current Driving Cycle, Only Indication (Pass).	0.0 counts	65,535 counts	Refer to DTC P0304 in the DTC summary table. ⇒ page 848

 If any of the components or systems fail to meet the specified values, refer to Diagnostic Mode 03: Interrogating Fault Memory to check for stored DTCs or the corresponding diagnostic repair procedure

⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20.

Switch the ignition off.

The specific of the correctness of information in the correctness of infor Diagnostic Mode 07 – Read Faults De-3.3.11 tected During the Current or Last Driving Cycle

Mode 07 makes it possible to check emissions-related faults which appeared during the current or last driving cycle (pending DTCs).

A pending DTC is saved the first time a fault is detected (output via Mode 07).

- If the fault is detected again by the end of the following driving cycle, a confirmed DTC is entered (output via Mode 03) and the MIL is activated.
- If this malfunction is not detected again by the end of the following driving cycle, the corresponding pending code will be deleted at the end of the driving cycle.



Note

Depending on the scan tool and protocol used, some of the information provided may be referred to by a different name.

Procedure

- Connect the scan tool.
- Start the engine and run at idle.



Note

If the engine does not start, crank the engine using starter for at least 5 seconds. Do not switch the ignition off afterward.

Select Mode 7: Check / test the results of components that are not continuously monitored.

The number of pending DTCs or 0 malfunctions detected will be displayed on the scan tool screen.

- Refer to the DTC tables below for the diagnostic repair procedures.
- ⇒ "3.4.1 Engine Control Module, 2013 2014 MY", page 69
- ⇒ "3.4.2 Engine Control Module, 2015 MY", page 169
- ⇒ "3.4.3 Engine Control Module, 2016 MY", page 365
- ⇒ "3.4.4 Engine Control Module, 2017 MY", page 560
- ⇒ "3.4.5 Engine Control Module, 2018 MY", page 766
- Switch the ignition off.

Diagnostic Mode 08 – Request Control 3.3.12 of On-Board System, Test or Component

Diagnostic Mode 08 is used to control the operation of an onboard system, test or component. A Mode 8 service can be used to turn on-board system ON or OFF, or to cycle an on-board system, test or component on or off for a specific period of time. The service can also be used to request system status or to report test results.

Test requirements

- No DTCs stored in the DTC memory.
- Intake Air Temperature (IAT) maximum 60° C.
- Coolant temperature 80 110° C.
- Throttle valve angle 12.0 16.0%.

Function test



Note

edby Volkswagen AG. Volkswagen AG does not guala If the accelerator pedal is depressed during the test, the test will be aborted.

- Connect the scan tool.
- Start the engine and run at idle for at least 15 minutes.
- Select "Mode 8: Tank Leak Test".
- Select "Test-ID 01: Tank Leak Test".
- Check the specified value of the tank leak test at idle.
- The following will be displayed on the scan tool screen:

Tank leak test	Specified value			
◆ Test function active	Test OK			
◆ Test function is being initiated, please wait	of info			
♦ Test off	information,			
◆ Test aborted	ionint			
- Switch the ignition off. If the specified result is obtained: System OK. If the specified result is Not obtained:	ing.			
- Switch the ignition off.				
If the specified result is obtained:				
System OK.				
If the specified result is Not obtained:				
 Repeat the tank leak test, switch the ignition off and start the 				

If the specified result is obtained:

If the specified result is Not obtained:

- Repeat the tank leak test, switch the ignition off and start the engine again and let run for 15 minutes at idle.
- Switch the ignition off.

If the specified result is again Not obtained:

A leak may be present. Refer to ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6

3.3.13 Diagnostic Mode 09 - Read Vehicle Information

Diagnostic Mode 09 makes it possible to access vehicle-specific information from the ECM and the TCM (where applicable).





Jetta Gen	The scan tool and protocol used. Diagnostic Mode and protocol used. Diagnostic text			
Note				
Depending or 09 and the intrame.	n the scan tool and protocol used. Diagnostic Mode G does not gual and protocol used. Diagnostic Mode G does not gual and protocol used. Diagnostic Mode G does not gual and g			
-	· "eeo			
l est requirem	ent Young State of the Control of th			
No DTCs :	stored in the DTC memory.			
Procedure				
 Connect th 	ne scan tool.			
 Switch the 	ignition on.			
 Select Mod 	de 09: Vehicle information.			
 Select the 	desired Test-ID.			
 The inform 	nation requested will be displayed on the scan tool			
screen.	seso			
The following	table is a numerical list of all Test-IDs that may be			
Selected.	laisus in the second se			
\$02:	Vehicle identification number (VIN) e.g.			
	◆ A different 17 digit number will be displayed for each vehicle			
\$04:	Calibration (dentification (ID) e.g.			
	◆ Engine Control Module			
	◆ Transmission Control Module			
\$06:	Calibration Verification Number (CVN) (check sum) e.g.			
	◆ EC5AE460 the check sum is different for every control module version			
	♦ 000D105			
\$08:	In-use Performance Tracking			
\$0A:	ECU Module Acronym And Text Name			
7.50	◆ Engine Control Module			
\$14:	Distance Traveled Since Evap Monitoring Decision			

- Switch the ignition off.

3.3.14 Diagnostic Mode 0A – Check Permanent DTC Memory



Note

- The following is a generic explanation of the requirements, coverage, and operation of Mode 0A.
- Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here.

- grammed. If a different program/data status is being programmed, Permanent Fault Codes should be erased after Update Programming.
- The procedure in Mode 01 through Mode 09 and in the service tester is NOT affected by implementation of the Permanent Fault Codes.







Note

After MIL off during the 40 warm-up cycle self-healing process, the fault may not be reported as Permanent Fault Code anymore

Procedure

- Jess, anymore

 Je clear Service \$0A
 Je erased at the end of a
 Je erase Erasing Permanent Fault Codes after code clear Service \$0A - Permanent Fault Codes: can only be erased at the end of a driving cycle (during ECM keep alive time) if all the following conditions are fulfilled:
- ERASE: Permanent Fault Codes after code clear, the vehicle needs to be driven!
- NO FAIL: DTC cleared
- **MONITORS: PASS**
- MINIMUM: Conditions fulfilled 600.0 s (cumulative) Engine
- DRIVE: 300.0 s (cumulative) vehicle speed > 25 mph (40 km/

3.4 **Engine DTC Tables**

- ⇒ "3.4.1 Engine Control Module, 2013 2014 MY", <u>page 69</u>
- ⇒ "3.4.2 Engine Control Module, 2015 MY", page 169
- ⇒ "3.4.3 Engine Control Module, 2016 MY", page 365
- ⇒ "3.4.4 Engine Control Module, 2017 MY", page 560
- ⇒ "3.4.5 Engine Control Module, 2018 MY", page 766 Protected by copyright, Copyright of Sommercials

Engine Control Module, 2013 – 2014 MY 3.4.1

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P000A	Intake Camshaft Position Slow Re-	Signal change > 8 CRK ° for > 2.9 s and ad- justment an- gle >= 2.50 CRK rev.	• Time after engine start > 3.0 s • Frequency 4 times • Frequency at cold start 2 times	• 14.0 s	tion Section Sectio	- Check the Camshaft Adjustment Valve 1 - N205 - Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 - Checking", page 1105 . - Check the Camshaft Position Sensor - G40 - Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 - Checking", page 1107 . - Check the Fuel Pressure Regulating Valve - N276 - Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve - N276 - Checking", page 1129 . - Check the Engine Speed Sensor - G28 - Refer to ⇒ "3.6.11 Engine Speed Sensor G28 - Checking", page 1121 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time o Length	s _{not} tion	Component Diagnostic Procedure
P0010	Intake Camshaft Position Ac- tuator Cir- cuit Open Bank 1	Signal voltage, > 4.7 % 1.	Camshaft valve off • Engine speed > 80 RPM			- Check the Engine Speed Sensor - G28 Refer to \$\frac{3}{3}.6.11\$ Engine Speed Sensor G28. Checking", page \$\frac{1}{2}\$ Checking". Position Sensor - G40- Refer to \$\frac{3}{2}\$ (Checking". Page 1107 . Check the Camshaft Adjustment Valve 1 - N205 Refer to \$\frac{3}{2}\$ (Camshaft Adjustment Valve 1 - N205 Refer to \$\frac{3}{2}\$ (Camshaft Adjustment Valve 1 - N205 Refer to \$\frac{3}{2}\$ (Camshaft Adjustment Valve 1 - N205 Refer to \$\frac{3}{2}\$ (Checking", page 1105).

P0011 Intake Camshaft Position Timing - Over-Advanced Bank 1 Signal charge = * Time after engine - \$ 14.0 s \$ 2.0 c \$ 5.0	DTC Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
DA negewein vor verification of the properties of justing the properti	Camshaft Position Timing – Over-Ad- vanced	> 8 CRK ° for > 2.9 s and ad- justment an- gle < 2.50 CRK rev.	start > 3.0 s Oil temperature -48 – 143.30° C Frequency 4 times Engine speed 600 - 6,000 RPM		/olkswagen AG do	Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121. - Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107. - Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft
			Copyright of the state of commercial purposes, in part or in whole, is part of the state of the	Protected	JA nagen A.G.	page 1105.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0016	Crankshaft Position – Camshaft Position Correlation	 Permissible deviation < -11 CRK° Or Permissible deviation > 11 CRK° 	_{sswagen} AG. Volkswagen AG	 20 rev. Multiple 	• 2 DCY	- Check the Engine Speed Sensor - G28- Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.
	esorcommercial purposes, in part or in whole, is not been	S. H.	_{SW} agen AG. Volkswagen AG	Nami	Se Oracional individual individua	- Check the Camshaft Position Sensor - G40- Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking". page 1107 . Check the Camshaft Adjustment Valve 1 - N205- Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205, Checking", Checking",
P0030		La Hostor valt	Time after engine start > 5.0 s Heater comman- ded off	. 0.5.0	[™] DCV	page 1105 . - Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0031	HO2S Heater Control Cir- cuit Low Bank 1 Sen- sor 1	• Heater volt- age < 0.0 – 3.26 V	 Time after engine start > 5.0 s Heater comman- ded off 	• 0.5 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P0032	HO2S Heater Control Cir- cuit High Bank 1 Sen- sor 1	• Signal current > 5.50 A	start > 5.0 s • Heater commanded on	• 0.5 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P0036	Heater Control Cir- cuit Bank 1 Sensor 2	Heater voltage, 4.50 – 5.50 V Heater voltage, 4.50 – 5.50 V Heater voltage of the state o		Vage (0.45) s oe _{s /}	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to **3.6.25** **3.6.25** **3.6.25** **3xygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P0037	HO2S Heater Control Cir- cuit Low Bank 1 Sen- sor 2	Heater voltage < 3.0 V	 Time after engine start > 5.0 s Heater, Commanded off 	• 0.5 s	· 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to 3 3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149 .
			Protected by Coo	. DA nagenz,	Morra	

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0038	HO2S Heater Control Cir- cuit High Bank 1 Sen- sor 2	• Heater current, > 2.70 - 5.50 A	 Time after engine start > 5.0 s Heater comman- ded on 	• 0.5 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
	MAF vs Throttle Position Correlation	 Plausibility with fuel system Load calculation < -22% Plausibility with fuel system Load calculation > 22% 	 Engine speed 1,280 – 6,000 RPM ECT > 63° C IAT < 90° C Mass air flow 0 – 300 kg/h Engine load 20 – 100% EVAP purge valve closed Fuel system monisor running Lambda control closed loop 		e of acceptant liability with rest	Regulator Valve 1 - N80 Refer to **3.6.12 EVAP Canister Purge Regulator Valve 1 N80 . Checking*,
)O 03/7	Studio Of Bulldoo Male Madoo Kal	Deloglogic Protected	дир Локемва	Judoo italifa da	

P0070 Ambient Air temperature < 50° C Croult P0071 Ambient Air Temperature < 50° C C C C C C C C C C C C C C C C C C C	Temperature Sensor Circuit Temperature Sensor Circuit Circui	DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Temperature Sensor Range/Performance value between ECT and AAT at engine of time) > 25 K And Difference in value between AAT and IAT at engine start (depending on engine off time) > 25 K Difference in value between AAT and IAT at engine start (depending on engine off time) > 25 K AAT @ engine ECT @ engine **AAT @ engine **Start <= 3 K Vehicle speed > 40 km/h Minus ECT @ time after engine start 60.0 s engine off time) > 25 K AAT @ engine **AAT @ engine **AAT @ engine **Start <= 5.2° C **Minus AAT @ engine **Start <= 5.2° C **Minus **AAT @ engine **AAT @ engine **Start <= 5.2° C **Minus **AAT @ engine **AAT @ engine **AAT @ engine **AAT @ engine **Start <= 5.2° C **Minus **AAT @ engine **AAT @	Temperature Sensor Range/Per- formance value between ECT and AAT at engine off time) > 25 K And Difference in value between AAT and IAT at engine start (depending on engine off time) > 25 K Minus AAT @ engine ECT @ time after engine start 60.0 s AAT @ engine start 60.0 s Bus Terminal Resistance. Checking page 1109 AAT @ condition veh speed > 25 mph for time > 30.0 s IAT @ condition veh speed > 25 mph for time > 30.0 s IAT @ condition veh speed > 25 mph for time > 30.0 s	P0070	Tempera- ture Sensor	temperature <	CAN active	• 6.0 s	• 2 DCY	Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148 . - Check the CAN-Bus terminal re- sistance. Re- fer to ⇒ "3.6.5 CAN- Bus Terminal Resistance, Checking",
.V.M.	Wayer Toteleda,	ove of commercial purposes, in part or in whole, is not beyon.	Temperature Sensor Range/Performance	value be- tween ECT and AAT at engine start (depending on engine off time) > 25 K • Difference in value be- tween AAT and IAT at en- gine start (de- pending on engine off time) > 25 K	 5.0 h ECT @ engine start < 2 K Minus AAT @ engine start < 5.3 K Vehicle speed > 40 km/h Minus ECT @ time after engine start 60.0 s AAT @ engine start < 5.2° C Minus AAT @ condition veh speed > 25 mph for time > 30.0 s IAT @ engine start < 5.2° C Minus IAT @ condition veh speed > 25 mph for time > 30.0 s IAT @ condition veh speed > 25 mph for time > 30.0 s 	of accept any liability with the control of the con		- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148 Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking",

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0072	Ambient Air Tempera- ture Sensor Circuit Low	Ambient air temperature > 77° C	CAN active	• 6.0 s	• 2 DCY	- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148.
		in whole, is not be mile by the second of th	sauthorised by Volks.			terminal resistance. Refer to 3.6.5 CANBUS Terminal Resistance.
		or normercial purposes, in part or	Tado Tulbundoo na papago ad	-9An	SEWS MO VED MOTHER	nage 1109. The correctness of information in this could be seen as the correctness of information in this could be seen as the correctness of information in this could be seen as the correctness of information in this could be seen as the correctness of information in this could be seen as the correctness of information in the correctness of in

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0087	Fuel Rail/ System Pressure - Too Low	 Fuel trim activity 0.90 – 1.15 Pressure controller activity > 2 MPa Difference between target and actual pressure > -16.4 	 Engine speed > 600 RPM EVAP purge adaptation < 22 ECT >= 63° C IAT < 90° C Lambda control closed loop 	• 5.0 s	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual.
						- Check the Fuel Pressure Sensor - G247 - Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 , Checking", page 1131 .
Whole is	ind interest authorized in the state of the	_{irised by Volkswagen} AG.	Volkswagen AG does not guar	antee or accept any like	Hitty with respec	- Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 , Checking", page 1129 .
mercial purposes, in part or in I	WOO NO SHAMA NO NO	Protected by copyright		auroo	, spect to the correctness of $info_{mation}{}_{info_{m}}$	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
	14A00) 1	Protected by COPUTER	. DA nagenagen V. Voz.	JOHNOO WE		<u> </u>

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0100	Mass Air Flow Circuit Fault	• MAF sensor signal 0 µs	Engine speed > 20 RPM	• 0.2 s	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 .
P0101	Mass Air Flow Circuit Range/Per- formance	Mass air flow vs. upper threshold model > 60 – 800 kg/h Lower threshold model < 0 – 400 kg/h Load calculation > 18% Fuel system < -18%	401	• 2.0 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3 - Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 . - Check the Intake Manifold Sensor - GX9 - Refer to ⇒ 3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 .
P0102	Mass Air Flow Circuit Low Input	• MAF sensor signal < 66 μs	• Engine speed > 20 RPM	• 0.2 s	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 Checking" page 1139 .
P0103	Mass Air Flow Circuit High Input	MAF sensor signal > 4,500	• Engine speed > 20 RPM		• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 .



DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	agnostic Proce-
P0106	Manifold Absolute Pressure Pressure Pressure Pressure Circuit Range Performance	Difference of boost pressure signal vs altitude sensor signal > 230 hPa Or Difference of boost pressure signal vs altitude sensor signal < -130 hPa Authoritidas internal	• Engine speed < 1,000 RPM • Throttle position < 11.50%	• 2.0 s	• 2 DCY Mith response	- Check the Throttle Valve Control Module - GX3 - Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 Check the Intake Manifold Sensor - GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 .
P0111	Intake Air Tempera- ture Sensor 1 Circuit Range/Per- formance	 Difference in value IAT - ECT @ engine start (depending on engine off time) > 25° C Difference in value IAT - AAT @ engine start > 25° C (depending on engine off time) 	 Engine off time > 5.0 h ECT @ engine start < 2 K Minus AAT @ engine start <= 3 K Vehicle speed > 40 km/h Minus ECT @ time after engine start 60.0 s AAT @ engine start < 5.2° C 	• 0.0 s	• 2 DCY	 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 . Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MILGIllumina- tion not gu	Component Diagnostic Procedure
P0112	Intake Air Tempera- ture Sensor 1 Circuit Low Input	• IAT > 141.0°C		• 2.0 s	• 2 DCY	- Check the Intake Manifold Sensor - GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 . - Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1415 .
P0113	Intake Air Tempera- ture Sensor 1 Circuit High Input	• IAT < -46° C	TO BUNGO WANDON O PAPADAJO.	• 2.0 s	• 2 DCY	- Check the Intake Manifold Sensor - GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 . - Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0116	Engine Coolant Tempera- ture Sensor 1 Circuit Range/Per- formance	 No change on signal < 2 K Or Signal in range >= 89° C with no change and signal <= 110° C 	140° Č (stuck hi) or 50.30 – 88.4° C (stuck low) • V • Temp 2:		• 2 DCY	- Check the Engine Coolant Temperature Sensor - G62 - Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62 - Checking", page 1117 - Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 - Refer to ⇒ "3.6.40 Engine Coolant Temperature Sensor On Radiator Outlet - G83 - Refer to Sensor On Radiator Outlet G83 - Checking", page 1119 - Checking", pag
P0117	Engine Coolant Tempera- ture Sensor 1 Circuit Low Input	ECT >140° (C) In part of the proposed in part of the part of	E B DO SERVING ON THE INCHOO KA DE	• 2.0 s	• 5 DCA	- Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117. - Check the Engine Coolant Temperature Sensor on Radiator Collection

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure
P0118	Engine Coolant Tempera- ture Sensor 1 Circuit High Input	• ECT < -40° C	_{ad} by Volkswagen AG. Volkswa	• 2.0 s	• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor - G62 Refer to ⇒ "3.6.9 En- gine Coolant Temperature Sensor G62, Checking", page 1117.
		mercial purposes, in part or in whole, is not bernited	• Engine speed > 480 RPM			Check the Engine Cool- ant Temper- ature Sensor on Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Cool- ant Temper- ature Sensor On Radiator Outlet G83, Checking", page 1119 .
P0121	Accelerator Pedal Posi- tion Sensor 1/Accelera- tor Pedal Position Sensor 2 Circuit Range/Per- formance	Actual TPS 1 calculated val- ue > TPS 2 calculated val-	Mdoo Aqpana		• 2 DCY	⊗Valve Con-
P0122	Accelerator Pedal Posi- tion Sensor 1/Accelera- tor Pedal Position Sensor 2 Circuit Low Input	Signal voltage < 0.20 V		• 0.1 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0123	Accelerator Pedal Posi- tion Sensor 1/Accelera- tor Pedal Position Sensor 2 Circuit High Input	• Signal voltage > 4.81 V		• 0.1 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169.
P0130	O2 Sensor Circuit Bank 1 Sensor 1	O2S ceramic temp. < 640° C	 Modeled exhaust temp > 300° C Fuel cutoff not active 	• 12.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
	Circuit.	 VM > 1.75 V UN > 1.50 V IA or IP > 0.30 V Wolkswagen Wolkswagen 	AG. Volkswagen AG does not		W liability with	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.
	Circuit, Bank 1 Sen- Sor 1 High Voltage	 UN > 4.40 V IA or IP > 7.0 V 		• 10.0 s	2 Dect to the correctness of information in this could be a second to the correctness of the correctnes	
	State of Bush	Protected by Copyright, Cop	Olkewagen AC:	Ved Might go ing	, in the second	
					3. Dia	gnosis and Testing

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0133	O2 Circuit Slow Re- sponse Bank 1 Sen- sor 1	 Signal dynamic slope check O2S signal front vs. modeled O2S signal ratio < 0.35 and > 0.01 Lower value of both counters for area ratios L to R and R to L > = 5 times Oscillation check Lambda amplitude signal > 20% Cycles > 8 Time lambda amplitude 400 ms Delay check Delay check Delay modeled lambda signal minus measured signal y 460.0 ms Cycles > 12 	1,200 – 2,800 RPM Engine load, 18 – 80% Delta engine load <= 7.99% Actual lambda, 0.85 – 1.15 Lambda control, Closed loop EVAP purge flow < 18- Determination of max and min slope ratios 0.01 — 4 — 4 — 4 — 4 — 4 — 4 — 4 — 4 — 4 —	Oscillation and delay check 200.0 s AG. Volkswage		nemess of information in this occurrence is a second of the second occurrence in the second occurrence is a second occurrence in the second occurrence is a second occurrence in the second occurrence is a second occurrence in the second occurrence in the second occurrence is a second occurrence in the second occurrence is a second occurrence in the second occurrence in the second occurrence is a second occurrence in the second occurrence in the second occurrence in the second occurrence is a second occurrence in the second occurrence in the second occurrence in the second occurrence in the second occurrence is a second occurrence in the second occurrence in the second occurrence is a second occ
P0135	O2 Heater Circuit Bank 1 Sensor 1	 Heater duty cycle, > 100% O2S ceramic temperature, < 715° C Time after O2S heater on 40.0 s 	 Heater control, Active Modeled exhaust gas temp, > 300° C ECT at start > -11° C Engine shutoff time > 300.0 s 	• 40.0 55.0 s	A S DCA	

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	O2 Circuit Bank 1 Sen- sor 2 Mal- function	heater switching > 2.0 V Number of checks >= 4	• Sensor voltage <= 0.40 V or 0.50 – 1.08 V	• 40.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P0137	O2 Circuit Low Volt- age Bank 1 Sensor 2	Cold condition Signal voltage, < 0.06 V for 3.0 s Warm condition Signal voltage < 0.01 V Reaction at closed loop enrichment - no reaction	 ECT at engine off, > 60° C ECT < 39.8° C Sensor voltage <= 0.40 V or 0.50 - 1.08 V Warm condition Sensor sufficient heated if exhaust temperature >= 650° C Modeled exhaust gas temp. 200.006 - 800.006° C for 60.0 s Sensor voltage <= 0.40 V Exhaust gas temp. >= 650° C for 18.0 s 	• 3.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P0138	O2 Circuit High Volt- age Bank 1 Sensor 2	Signal voltage > 1.08 V for > 5.0 s	 Sensor voltage <= 0.40 V Exhaust gas temp. >= 650° C for 18.0 s 	• 5.00 to the correctness of information in this course	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P0139	Slow Re- sponse Bank 1 Sen-	EWMA filtered transient time at fuel cutoff > 0.0 s In voltage range of 201 = 401.0 mV Number of checks, >= 3	ble > = 547.9 mV	• 100.0 s	• 1 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P013 A	O2 Sensor Slow Re- sponse Rich to Lean Bank 1 Sensor 2	EWMA filtered max differential transient time at fuel cutoff >= 0.65 s Number of checks >= 1	<= 90.0 s • Time after last fuel cutoff >= 20.0 s • O2S rear ready		• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
P0140	O2 Circuit No Activity Detected Bank 1 Sen- sor 2	 Signal voltage Signal voltage, 0.40 – 0.60 V for > 3.0 s Internal resistance > 40,000 Ω 			• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking". page 1149
P0141	O2 Heater Circuit Bank 1 Sensor 2	Heater resist- ance, 702 – 5,250 Ω	Heater comman-	• 15.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P0142	O2 Sensor Circuit Bank 1 Sensor 3	 Delta voltage one step at heater > 2.0 V number of checks, 4 	 Modeled exhaust gas temp 700° C for > 10.0 s Dew point exceeded and lower exhaust gas temp limit exceeded for 60.0 s. 	• 40.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0143	O2 Sensor Circuit Low Voltage Bank 1 Sen- sor 3	 Cold/Warm condition Signal voltage < 0.06 V for > 3.0 s 	 Cold condition Sensor voltage <= 0.40 V or 0.50 - 1.08 V Modeled exhaust gas temp. 700 °C for > 10.0 s Heater power >= 50% for > 10.0 s 	• 3.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P0144	O2 Sensor Circuit High Voltage Bank 1 Sen- sor 3	Signal voltage > 1.08 V for > 5.0 s	Cold condition Sensor voltage <= 0.40 V or 0.50 – 1.08 V Modeled exhaust gas temp. 700° C for > 10.0 s Heater power >= 50% for > 10.0 s Rives authorised by Sixes	• 5.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7. Checking". page 1149.
P0145	O2 Sensor Circuit Slow Response Bank 1 Sen- sor 3	EWMA filtered transient time at fuel cutoff > 1.2 s In voltage range of 2012 - 401.4 mV Number of checks, 3	• Rich voltage ena- ble > = 548.0 mV • Lean voltage < = 201.2 mV	• 100.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149. - Check the Oxygen Sensor 1 After
P0146	O2 Sensor Circuit No Activity De- tected Bank 1 Sensor 3	 Signal voltage 0.40 – 0.60 V for > 3.0 s Internal resistance > 40,000 Ω 	Sensor voltage <= 0.40 V or 0.50 – 1.08 V	• 38.0 s	. 5 DCA	- Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6:25 Oxygen Sen- sor 1 After Catalytic Converter GX7, Check- ing", page 1149

P0147 Q2 Sensor Heater (CIL Internal) Potential Potentia	DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0169 Incorrect Fuel correction factor incorrect Internal check failed Fuel correction factor incorrect Fuel correction factor incorrection fac	P0147	O2 Sensor Heater Cir- cuit Bank 1	Heater (ECM internal) resistance 792 –	gas temp 250 – 650° C • Engine shutoff time > 60.0 s • Fuel cutoff not active • Number of checks 10 • Heater comman-		• 2 DCY	Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking",
	P0169	Fuel Com-	incorrect • Fuel correction factor incorrect • Internal check failed	1,200 RPM	AG. Volkswag	en AG does not 9ua	contaminated/aged fuel or possible high concentration of alcohol in fuel (above 15%). Poor quality fuel will also increase consumption. Replace with fresh fuel if believed to be contaminated. Refer to appropriate repair manual. - Check the Oxygen Sensor 1 Before Catalytic Converter GX10 - Refer to #3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10 Checking page 1152. - Replace the Engine Control Module J623 - Refer to appropriate repair manuals are repair manuals.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Strategy Description System Too Lean Bank 1	teria and Thresh- old Value	ters with Enable Conditions At idle Engine speed, 560 – 1,200 RPM Engine load, 9 – 45% Mass air flow 5 – 23 kg/h ECT > 63° C IAT < 90° C Part load adaptation ready Lambda control Closed loop EVAP purge valve, closed No low fuel signal At part load Throttle position < 99.6% Engine speed 1,320 – 5,000 RPM Engine load 20 – 100% Mass air flow 27 – 450 kg/h	Time Length • 10.0 s	• 2 DCY	- Check the intake system visually for leaks. - Check the intake system visually for leaks (false air). - Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. - Check the Fuel Pressure Sensor G247 - Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247. Checking", page 1131. - Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors . Checking", page 1127. - Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to GX7 -
						Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149 . Check the Oxygen Sen-

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	4.0	Component Diagnostic Procedure	
			ters with Enable Conditions ditions ters with Enable Conditions it follows in the conditions in the	Volkswagen AG	i. Volkswagen AG	sor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sen- October Catalytic Converter GX10. Checking". page 1152. - Check the Fuel Delivery Unit - GX1-/ Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing". page 1125.	ot and liability with respect to the correctness of informations.
			E O TO SERVICE OF SUBJECTION O	Protected by C	.ĐAna	BEWEAHOV LOTHENRAGO IN	tion in this co.

stem Too ch Bank 1	At idle Adaptive value < -5.02% At part load Adaptive value < -21%	 At idle Engine speed, 560 – 1,200 RPM Engine load, 9 – 45% Mass air flow 5 – 23 kg/h ECT > 63° C IAT < 90° C Part load adaptation ready Lambda control 	• 10.0 s	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual.
		 ECT > 63° C IAT < 90° C Part load adaptation ready 			liminary Check", page 13 and/ or to appro- priate repair
		 Lambda control 			manual.
		 closed loop EVAP purge valve closed No low fuel signal At part load 			- Check the Fuel Pres- sure Sensor - G247 Re- fer to ⇒ "3.6.16 Fuel Pres- sure Sensor
		 Throttle position < 99.6% Engine speed 1,320 – 5,000 RPM 	wagen AG a		G247, Checking", page 1131. - Check the Fuel Injectors . Refer to
	ikadinessauro	 Engine speed 1,320 – 5,000 RPM Engine load 20 – 20 – 100% Mass air flow 27 – 450 kg/h ECT > 63° C 	does	not guarantee or acce	⇒ "3.6.14 Fuel Injectors, Checking", page 1127.
	or in whole is not be my	 IAT < 90° C Lambda control closed loop EVAP purge valve closed 			Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to 3.6.26
	neroial purposes, in part	No low fuel signal			Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.
	TWO TO STRANGED TO THE STRANGE	BUAGO AG POJODIO L.	Swager National Control of the Contr	WO V WO MONDINGO Jing	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump
		Copyring to the state of the st	IAT < 90° C Lambda control closed loop EVAP purge valve closed No low fuel signal	IAT < 90° C Lambda control closed loop EVAP purge valve closed No low fuel signal	closed loop • EVAP purge valve closed • No low fuel signal

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
						Testing", page 1125. - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139.	
			oo ka	jikswagen AG. \	iolkswagen AG do	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6 12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123	
P0190	Fuel Rail Pressure Sensor Cir- cuit		Signatural participation of commercial participation of the participatio			- Check the Fuel Pressure Sensor G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 . Checking", page 1131 . - Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve - N276 . Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve - N276 . Refer to ⇒ "3.6.15 Fuel Pressure Regulation Valve N276 . Checking", page 1129 .	with respect to the correctness of information in the

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0191	Pressure	Actual pressure > 20.6 MPa	Time after engine start > 0.0 s Engine speed > 90 RPM RPM Authorities autho	• 3.0 s AG. Volkswage	• 2 DCY Pin AG does not gua	- Check the Fuel Pressure Sensor G247 Refer to *3.6.16 Fuel Pressure Sensor G247, Checking page 1134. - Check the Fuel Pressure Regulating Valve N276 Refer to *3.6.15 Fuel Pressure Regulator Valve N276, Checking page 1129 Check the N276. Checking page 1129 Check the Pressure Regulator Valve N276. Checking page 1129
P0192	Fuel Rail Pressure Sensor Cir- cuit Low In- put	Signal voltage of 0.2 V	Rog Blindoo in Bindoo Na boloolor	• 0.5 s	• 2 DCA	Fuel Pressure Sensor - G247 . Refer to
						- Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 . Checking". page 1129 .
P0201	Injector Cir- cuit Open Cylinder 1	 Low side signal current < 2.1 A Internal logic failure 	 Engine speed, > 80 RPM Injection valve switched on 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0202	Injector Cir- cuit Open Cylinder 2	Low side signal current < 2.1 A Internal logic failure	 Engine speed, > 80 RPM Injection valve switched on 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
P0203	Injector Cir- cuit Open Cylinder 3	 Low side signal current < 2.1 A Internal logic failure 	 Engine speed, > 80 RPM Injection valve switched on 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127
P0204	cúit Open Cylinder 4	 Low side signal current 2.1 A Internal logic failure 	Engine speed, > 80 RPM Injection valve switched on	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127
P0221	Accelerator Pedal Posi- tion Sensor 1 / Acceler- ator Pedal Position Sensor 2 Circuit Range/Per- formance	ue > TPS 1 Scalculated value • TPS 2 - calc. value ≥ 9.0%	480 RPM	• 0.3 s	Goog DCY	- Check the Throttle Valve Control Module - GX3 Refer to 3.6.34 Throttle Valve Control Module GX3, Checking", page 1169
P0222	Accelerator Pedal Posi- tion Sensor 1/Accelera- tor Pedal Position Sensor 2 Circuit Low Input	Signal voltage <		• 0.1 s	• 2 DCY	- Check the Throttle Valve Congression To Module GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169.
P0223	Accelerator Pedal Posi- tion Sensor 1/Accelera- tor Pedal Position Sensor 2 Circuit High Input	Signal voltage > 4.81 V	Hoo yd beloeford	• 0.1 s	· 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	ditions	Monitoring Time AdLengthage	tion	Component Diagnostic Procedure
P0234	Turbo- charger Overboost Condition	Difference of set value boost pressure vs altitude sensor signal > 260 – 1,275 hPa	• Altitude 5 2,700 m	• 1.2 s	• 2 DCYt gual	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31 Checking", page 1115 - Check the Charge Air Pressure Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking page 1143.
P0236	Turbo- charger Boost Sen- sor Circuit Range/Per- formance	Difference of boost pressure signal vs. altitude sensor signal >	Inrottle position <	• 2.0 s	• 2 DCY	Check the Charge Air Pressure Sensor -

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0237	Turbo- charger Boost Sen- sor Circuit Low	Signal voltage < 0.2 V	Engine speed > 80 RPM RPM Jokswagen AG. Volkswagen Jokswagen Jokswag	• 0.5 s	• 2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8
		ilika diles sault			oraccan indigital	Charge Air Pressure Sensor G31, Checking", page 1115
	ercial purposes, in part or in whole, is		Secondary Parameters with Enable Conditions • Engine speed > 80 RPM I olkswagen AG. Volkswagen Region of the speed > 80 RPM			Check the Charge Air Pressure Actuator - \$\fomm{405}{465} \cdot \text{. Refer to } \text{. Charge Air Pressure Actuator V465, Checking", page 1113}
P0238	Turbo- charger Boost Sen- sor Circuit High	Signal voltage > 4.88 V	• Engine speed > 80 RPM • And • Throttle position < 6.81%	• 0.5 s	• 2 DCY	Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115
						- Check the Charge Air Pressure Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
P025 A	Fuel Pump Module Control Cir- cuit Open	Signal voltage 4.40 - 5.60 V	• Engine speed > 80 RPM	• 0.5 s	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Con-	Monitoring Time Length	Mflumina- tion	Component Diagnostic Proce-
P025 C	Fuel Pump Module Control Cir- cuit Low	part or in whole	• Engine Speed > 80 RPM	• 0.5 s	• 2 DCY	- Check the Fuel Delivery Unit - GXT- / Fuel Pump Control Module - J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 . - Check the Fuel Delivery Unit - GX1 - / Fuel Pump Control Module - J538
P025 D	Fuel Pump Module Control Cir- cuit High	Signal current 1.10 A	Engine speed > 80 RPM Injection valve		• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
P0261	Cylinder 1 Injector Cir- cuit Low	Signal current < 2.1 A	 Injection valve commanded on Engine speed, > 80 RPM High side signal current, > 4.20 A 	• 0.5 s	2 DCY Actual TPS 2 calcula- ted value > TPS 1 calcula- ted value	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
P0262	Cylinder 1 Injector Cir- cuit High	Signal current > 14.70 A	 Injection valve commanded on Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.
P0264	Cylinder 2 Injector Cir- cuit Low	Signal current < 2.1 A	 Injection valve commanded on Engine speed > 80 RPM High side signal current > 4.20 A 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
P0265	Cylinder 2 Injector Cir- cuit High	Signal current > 14.70 A	 Injection valve commanded on Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL filumina-	Component Diagnostic Procedure
P0267	Cylinder 3 Injector Cir-cuit Low	Signal current < 2.1 A	 Injection valve commanded on Engine speed > 80 RPM High side signal current > 4.20 A 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
P0268		Signal current > 14.70 A	 Injection valve commanded on Engine speed, > 80 RPM 	• 0.5 s	• 2 DCY	Check the Fuel Injectors . Refer to 33.6.14 Fuel Injectors , Checking", page 1127
P0270	Cylinder 4 Injector Cir- cuit Low	Signal current < 2.1 A	Injection valve commanded on Engine speed > 80 RPM High side signar current > 4.20 A	• 0.5 s	• 2 DCY of the land of the lan	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
P0271	Cylinder 4 Injector Cir- cuit High	Signal current > 14.70 A	 Injection valve commanded on Engine speed, > 80 RPM 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.
P0299	Turbo- charger Un- derboost	Difference of set boost pressure vs actual boost pressure value > 150 hPa	 Engine speed > 2,800 RPM Altitude < 2,700 m Difference of set value boost pressure vs basic boost pressure value > 250 hPa Boost pressure control active Turbo charger bypass valve closed 	• 6.0 s	• 2 DCY	 Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115. Check the Charge Air Pressure Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0300	Random Misfire De- tected	Emission threshold 1st interval Misfire Rate (MR) > 2.65% Catalyst damage misfire rate (MR) > 3% – 20%	• Time from start 0.0 s • IAT > -48° C • Time after engine start idle +/- 150 RPM and 1 cam rev • Engine torque > 5.47 - 23.4% • Camshaft revolutions 1 • Engine speed range 440 - 6,800 RPM • Fuel cutoff not active • ECT at start > -48° C	rev • 200 rev • Immediate	AG does not guaran	buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. - Check the fuel pressure and delivery quantity. Refer to fuel

DTC	Monitor Strategy Description	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	•		3		Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power
					Output Stage , Checking", page 1133 .



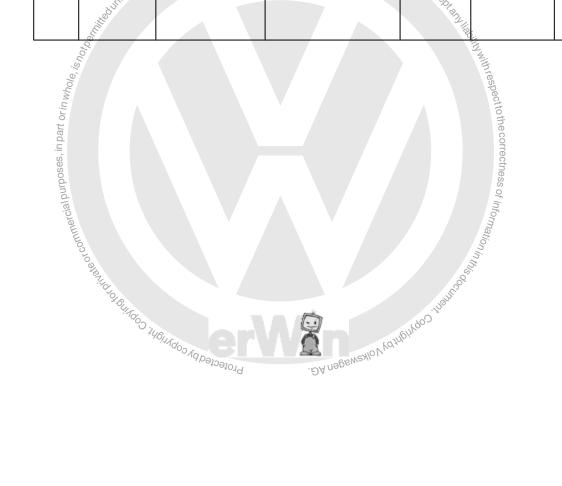
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
ercial purposes, in part or in whole, is.	Cylinder 1 Misfire Detected Stoolegathology and the stool of the stoo	Emission threshold 1st interval Misfire Rate (MR) > 2.65% Catalyst damage misfire rate (MR) > 3% – 20% Outgoon Agranagen AG. Seed by Volkswagen AG.	 Time after engine start, Idle +/- 150 RPM and 1 cam rev. Engine torque > 5.47 - 23.4% 	rev • 200 rev • Immediate	with respect to the correctness of information	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in \$\frac{*3.1 \text{ Pre-liminary}}{2000 \text{ Check}^2\$, page 13 and/or to appropriate repair manual. Check the Fuel Injectors. Refer to \$\frac{*3.6.14}{2000 \text{ Fuel Injectors}, Checking", page 1127}. Check the Ignition Coils with Power

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
						Output Stage . Refer to ⇒ "3.6.17 lg- nition Coils With Power Output Stage . Checking", page 1133 .



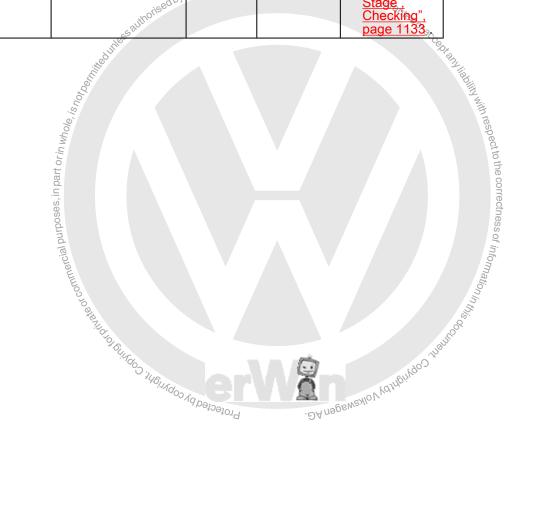
1	DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P		Cylinder 2 Misfire De- tected	 Emission threshold 1st interval Misfire Rate (MR), > 2.65% Catalyst damage misfire rate (MR), > 3% - 20% 	 Time from start, 0.0 s IAT, > -48° C Time after engine start, Idle +/- 150 RPM and 1 cam rev. Engine torque, > 5.47 - 23.4% Camshaft revolu- 	1,000 rev200 revImmediate	• 2 DCY	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check for an
		uthorised by Volkey	_{vage} n AG. Volkswagen,	• Engine speed range, 440 – 6,800 RPM • Fuel cutoff not active • ECT at start > -48° C			engine me- chanical fault with a cylin- der compres- sion test. Carbon buildup may cause a high- er than nor- mal com- pression reading and may contrib- ute to this concern. Re- fer to appro- priate repair manual for low com- pression readings or for carbon buildup re- moval.
I purposes, III part or in whole, is not be mit.	of the state of th	PO JUBUIANO NA POJ		Tal Gold State of the State of	liability with respect to the correctness of i		 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual.
or commercial	id to to the day			(800) iyayind	nformation in this of		 Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.
		146/1VGODVdb91	Bry I	Magswello V Varibing			 Check the Ig- nition Coils with Power

DTC	Monitor Strategy Description		Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	entitle diness autro	ised by Volkswagen AG. '	/olkswagen AG does not gu _{are}	Mes or accept and like		Output Stage . Refer to ⇒ "3.6.17 lg- nition Coils With Power Output Stage , Checking", page 1133 .



DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0303	Cylinder 3 Misfire De-	• Emission threshold 1st, interval Mis- inte	Time from start, 0.0 s IAT, > -48° G Time after engine start, Idle +/- 150 RPM and 1 cam rev. Engine torque, >	• 1,000 rev • 200 rev • Immediate	• 2 DCY	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127. Check the Ignition Coils with Power

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			s autroised by	Jolkswagen AG	Volkswagen A G q	Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage Checking", page 1133



DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
or commercial purposes, in part or in whole, is hotbern;	Cylinder 4 Misfire Detected Land British Control of the Control o	Emission threshold 1st interval Misfire Rate (MR), > 2.65% Catalyst damage misfire rate (MR), > 3% = 20%	Time from start 0.0 sIAT > -48° C	1,000 rev 200 rev Immediate	• 2 DCY	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 . Check the Ignition Coils with Power

DTC	Monitor Strategy	Malfunction Cri- teria and Thresh-	Secondary Parameters with Enable Con-	Monitoring Time	MIL Illumina- tion	Component Diagnostic Proce-
	Description	old Value	ditions	Length	uon	dure
						Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking", page 1133 .
P0321	Engine Speed Input Circuit Per- formance	 Comparison of counted teeth vs reference = incorrect Monitoring reference gap failure 		• 1.5 s	• 2 DCY	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28. Checking". page 1121.
		- ann	G. Volkswagen A.C.,			- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 .
	Engine Speed Input Circuit No Signal	*NOTISES	and does not g	• 2.5 s	• 2 DCY	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.
ses.in ba			G. Volkewagen AG does not g		pect to the correctness of information in	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 .
100	Secundad Bliston	eneric Scan Tool	DA Nagsweylov	Kalingo, inging	The second	
108	Rep. Gr.ST - G	eneric Scan Tool				

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P032.	Knock Control System Error	 Signal fault counter (combustion) > 24 Or Signal fault counter (measuring window) > 2.0 	• Engine speed 2,500 RPM	sum respect to the correctness	• 2 DCY	- Check the Knock Sensor 1 - G61 Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.
P032	sor 1 Circuit	Lower threshold < -0.70 V or for signal range check Lower threshold < 0 - 1.60 V	 Engine speed, > 1000 RPM or for signal range check ECT > 41 °C Engine load > 35 - 60% Engine speed > 2000 RPM 	• 0.5 s of information in this cool	• 2 DCY	- Check the Knock Sensor 1 - G61 Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.
P032	3 Knock Sen- sor 1 Circuit High	Upper thresh- old > 1.0 V Or for signal range check > 15 - 115.87	 Engine speed, > 1,000 RPM Or for signal range check ECT > 40.5° C Engine load > 35 - 60% Engine speed > 2000 RPM 	• 0.5 s	• 2 DCY	- Check the Knock Sensor 1 - G61 Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.
P034	Camshaft Position Sensor Cir- cuit	Cam adaption values out of range > 20° KW < -20° KW Difference of adapted and actual values > 9° KW	 Engine speed sensor no DTC Phase sensor no DTC Cam adaptation active Engine speed sensor no DTC Phase sensor no DTC Camshaft adjustment no DTC Engine start completed Cam adaptation completed Camshaft in ref pos. for > 2.0 s 	• 2.0 s	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 . Checking". page 1107 Check the Engine Speed Sensor - G28 . Refer to ⇒ "3.6.11 Engine Speed Sensor G28 . Checking". page 1121 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P0341	Camshaft Position Sensor Cir- cuit Per- formance	 Signal pattern incorrect Defect counter 12 		• 0.5 s	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 .	
			so de la	py Volkswagen	.G. Volkswagen A	sor - G28	Control of the state of the sta
P0342	Camshaft Position Sensor Cir- cuit Low	 Signal voltage low Crankshaft signals = 8 	Copyright or in whole is not in whole is not in whole is not or in whole is not in whole in whole is not in whole is not in whole in which in whole is not in whole in which in whole is not in which in which in which in which is not in which	• 0.5 s	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 - Check the	od and liability with respect to the correctness of information in this odd, the
			SENICHO BUNGOO HUBING	Protected by	. ЭА.	Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.	in the state of th

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0343	Camshaft Position Sensor Cir- cuit High	Signal voltage high Crankshaft signals = 8 Signals = 8	Secondary Parameters with Enable Conditions Olkswagen AG. Volkswagen AG. Volkswa	• 0.5 s	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 . Checking", page 1107 .
	al purposes, in part or in whole, is n					Check the Engine Speed Sensor - G28 Refer to \$\frac{3.6.11}{Engine}\$\frac{5peed Sen-esor G28}{Checking}\$\frac{7}{h}\$\frac{7}{page 1121}\$.
P0351	0::	0.20 2.0	• Engine speed > 680 RPM	2.0 sContinuous	• 2 DCY	Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ig-
		• Internal check failed	Protected b	no Volkswager	GINGO TH	nition Coils With Power Output Stage, Checking", page 1133.
P0352	Ignition Coil B Primary Circuit	 Signal current 0.25 – -2.0 mA Internal check failed 	680 RPM	2.0 sContinuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage, Checking", page 1133 .
P0353	Ignition Coil C Primary Circuit	Signal current 0.25 – -2.0 mA Internal check failed	680 RPM	2.0 sContinuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0354	Ignition Coil	Signal current 0 25 2 0 mA	Engine Speed > 680 RPM			agnostic Procedure - Check the Ignition Coils with Power Output Stage Refer to 3.6.17 Ignition Coils With Power Output Stage Checking", page 1133.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	AIR System	pressure sen- sor > 5.0 kPa	 Mass air flow 7 – 140 kg/h Delta engine load –7 – 7% ECT 5.3 – 50.3° C IAT 5.3 – 60° C Altitude < 2,700 m SAI press sensor ready no fault 	• 0.5 s • Once / DCY	• 2 DCY	- Check the Secondary Air Injection Sensor 1 - G609 - Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609 , Checking", page 1159 .
oial purposes, in part or in whole, is not been in the signal of the sig	adunias authoris ad h	y Volkswagen AG. Volks	• ECT 5.3 – 50.3° C • IAT 5.3 – 60° C • Altitude < 2,700 m • SAI press sensor ready no fault wagen AG does not guaranteed	Facceptany liability with response	ect to the correctness of inc	Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157. Check the Secondary
ommercon solution of commerce	*C. 101811/1000 ;1461/1/10	Protected by co	DA INBURNAJON VOIKENNEGEN AG.	mation in this oo culture of the cul		Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112 Checking", page 1163 - Check the Secondary
						Air System - GX24 Re- fer to ⇒ "3.6.32 Secondary Air System GX24 . Checking", page 1165 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0413	Switching Valve "A" Circuit Open	4.70 – 5.40 V	ded off • Engine speed > 80 RPM	• 0.5 s	• 2 DCY	- Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163.
		da interest differences	yoy Volkswagen A.G. Volkswag	en AG does not	Quarantee or accept any	- Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 . Checking", page 1165 .
P0414	Switching Valve "A" Circuit Shorted	 Or Signal voltage Or Signal current 2.20 A 	 All valve commanded off Engine speed > 80 RPM Or Air valve commanded off 	0.3 \$	2 001	Secondary Ali Injection Solenoid Valve - N112 Refer to 2 ⇒ 3.6.31 Secondary Air Injection Solenoid Valve N112 Checking*
		The designation of the state of	Protected by	DA nagswaylo	NOMBINDO italino	Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 . Checking", page 1165 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0418	AIR System Control "A" Circuit	• Signal voltage 4.70 - 5.40 V	 Pump relay commanded off Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157 .



DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0420	Strategy Description	teria and Threshold Value Front: Oxygen storage capacity (OSC) vs OSC of borderline catalyst < 1.0 Front catalyst < 1.50 Main catalyst < 1.0 Main: Oxygen storage capacity (OSC) vs OSC of borderline catalyst < 0.40 Front catalyst < 0.90 While value for front catalyst < 2.0	 ters with Enable Conditions Front: Time after engine start > 0.0 s Delta exhaust mass flow < 23.1 kg/h Exhaust gas mass flow, lower range 40.0 - 130.0 kg/h Exhaust gas mass flow upper range 60.0 - 130.0 kg/h Modeled exhaust gas temp, lower range > 460° C Modeled exhaust gas temp, upper range 640 - 780° C Engine speed 1,320 - 3,520 RPM Number of checks 4 and the conditions 	Time Length • 15.0 – 40.0 s • Once / DCY	• 2 DCY	agnostic Procedure - Check the Three Way Catalytic Converter (TWC). Refer to ⇒ "3.6.33 Three Way Catalytic Converter, TWC Checking", page 1168 . - Check the Oxygen Sensor 1 After Catalytic Converter - GX7 - Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter - GX7 - Refer to catalytic Converter
		s is not be smill to the smill	 O2S front/rear, ready/no faults SAS, not active No misfire Main: Time after engine start > 80.0 s Delta exhaust mass flow < 30 kg/h Exhaust gas mass flow, lower range 25.0 - 80.0 kg/h Exhaust gas mass flow upper range 60.0 - 160.0 kg/h Modeled exhaust gas temp, lower range 435 - 660° C Modeled exhaust gas temp, upper range 530 - 740° C Engine speed 1,200 - 3,520 RPM 			Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 . Refer to 3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10 . Checking page 1152.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	ditions	Monitoring Time Length	l tion	agnostic Proce-
P043 E	Emission System Leak Detec- tion Refer- ence Orifice Low Flow	e EVAP pump current during reference measurement engine off > 40.0 mA	 ECT @ start >= 4° C Difference between ECT and IAT @ start <= 15 K Engine off time >= 5.0 s Airbag not activated ECT @ start < 60° C 	• 10.0 s	• 2 DCY	Check the Leak Detection Pump - V144 Refer to 3.6.22 Leak Detection Pump V144, Checking", page 1143.
P043 F	Evaporative Emission System Leak Detec- tion Refer- ence Orifice High Flow	current during reference measurement engine off >	 Front O2S ready ECT @ start >= 4° C Difference between ECT and IAT @ start <= 15 K Engine off time >= 5.0 s Airbag not activated 	• 10.0 s	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 , Checking", page 1143 .

		1	1/9/5		4/	g _D ,
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	agnostic Proce-
		EVAP pump current during reference measurement engine on > 15.0 mA 15.0 m	C AAT 425° C	• 2.5 s	• 2 DCY	Miliability with respective to the mormatic
P0441	Evaporative Emission System In- correct Purge Flow	0.	Evap purge flow integral 25 – 120 g Integrated air mass 1.50 – 2.50 kg Engine speed = idle Engine speed deviation < 80 RPM ECT > 65° C or substitute 80° C IAT > 4° C Altitude < 2,700 m Lambda control closed loop	• 120.0 s • Once / DCY	• 2 DCY	Check the EVAP Canister Purge Regulator Valve 1 -

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DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0442	-	• Time for pressure drop < 1.6 – 1.8 s	3.3.5.1.5	• 139.0 s • Once / DCY	kswagan	- Check the EVAP System for Leaks. Refer to ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 .
P0444	Evaporative Emission System Purge Con- trol Valve Circuit Open	Signal voltage	i snotpermi		• 2 DCX	tion Pump V144, Checking", page 1143. Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. Check the Leak Detection Pump V144 - Checking", page 1143.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Con- ditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0447	Evaporative Emission System Vent Con- trol Circuit Open	• Signal voltage > 4.70 – 5.40 V	EVAP purge valve commanded Off Output Description Output Description Des	• 0.5 s	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P0448	Evaporative Emission System Vent Con- trol Circuit Shorted to B+ or ground	 Short to B+ - Signal current > 2.2 - 4.0 A Short to Ground - Signal voltage < 2.74 - 3.26 V 	• Short to B+ - EVAP	• 0.5 s	• 2 DCY	- Check the Leak Detec- tion Pump - V144 Refer to ⇒ "3.6.22 Leak Detec- tion Pump V144 . Checking", page 1143 .
P0455	Evaporative Emission System Leak Detec- ted Gross Leak/No Flow	Time for pressure drop < 1.0 s	start 12 – 65,530,0	• 136.0 s		- Check the EVAP System for Leaks: Refer "2.2.4 EVAP System, Checking for Leaks", page 6. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.

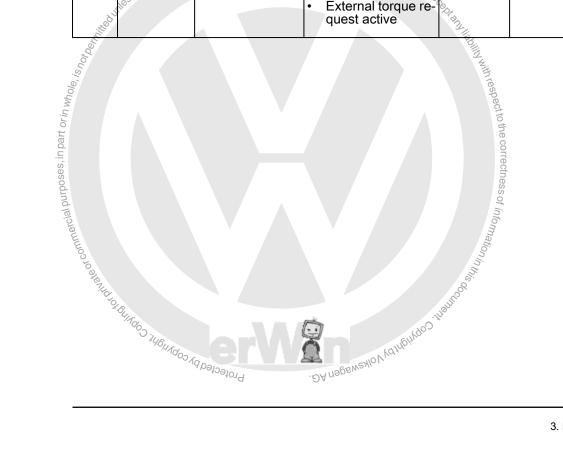
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0456	Evaporative Emission System Leak Detec- ted Very Small Leak	sure drop, < 4.5 – 6.0 s	start 12.0 - 1,000.0 s ECT 3.8 - 120° C ECT at start 3.8 - 50.3° C Engine off time > 21,600.0 s Ambient air temp 3.8 - 59.3° C Ambient air temp drop after start < 4.5 K Intake manifold vac. > -2,560 hPa Intake manifold vac. > -2,560 hPa Altitude < 2,700 m Veh. speed >= 0 Veh speed once > 40 km/h Any drive gear Restart temp diff. > 0 K Purge valve closed			- Check the EVAP System for Leaks. Refer to "2.2.4 EVAP System, Checking for Leaks", page 6. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P0458	Evaporative Emission System Purge Con- trol Valve Circuit Low	Signa voltage 0 – 3.26 V	EVAP purge valve commanded off Engine speed > 80 RPM Augusta	• 0.5 s	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 N80- Refer to 36.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123

DTC Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0459 Evaporative Emission System Purge Con- trol Valve Circuit High	• Signal current > 2.2 A	commanded on	• 0.5 s	• 2 DCY G. Volkswagen A	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80 , Checking", page 1123 .
		Engine speed > 80 RPM RPM Individual purposes, in part or in white the property of the			N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123.

DTC Monito Strateg Descripti	y teria and Thresh-	Secondary Parame- ters with Enable Con- ditions	Monitoring Time Length	l tion	Component Diagnostic Procedure	
P0491 Seconda Air Syste Insufficie Flow	SAI pressure sensor vs modeled pressure < 60 – 75%	Mass airflow 7 and 140 kg/h	• 43.5 s	• 2 DCY	- Check the Secondary Air Injection Sensor 1 - G609 - Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609 - Checking", page 1159 . - Check the Secondary Air Injection Pump Relay - J299 - / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101 - Checking", page 1157 . - Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112 - Checking", page 1163 . - Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 Refer to ⇒ "	Tan lab.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0501	Vehicle Speed Sen- sor Range/ Perform- ance	VSS signal < 6 km/h	 Engine torque > 120 Nm Engine speed > 2,800 RPM 	• 2,000 ms	• 2 DCY	- Check the vehicle speed signal. Refer to ⇒ "3.6.36 Vehicle Speed Signal, Checking", page 1174.
			ed in less authorised by Volkswage	n AG. Volkswag	en AG does not gu _é	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance. Checking", page 1109
P0503	Vehicle Speed Sen- sor Intermit- tent/Erratic/ High	Vehicle speed > 290 km/h Moor or in mart or in whole of or in whole of or in whole of or in whole or or or in whole or or or in whole or	to to to the state of the state	• 0.5 s	• 2 DCY	- Check the vehicle speed signal Refer to ⇒ "3.6.36 Vehicle Speed Signal, Checking", page 1174. - Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
P0506	Idle Air Control System RPM Lower Than Ex- pected	 Integrated engine speed deviation > 2,000 RPM Or Engine speed deviation > 80 RPM 	 Engine speed, idle Vehicle speed 0 MPH Altitude < 2,700 m IAT > -48° C 	• 3.0 – 5.0 s	A Y Olkswagen A G	

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0507	Idle Air Control System RPM High- er Than Ex- pected	Idle speed deviation < -80 RPM	 Engine speed, idle Vehicle speed 0 MPH Altitude < 2,700 m IAT, > -48° C ECT, > -48° C Time after engine start > 0.0 s Lambda control active 	• 6.0 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
P050 A	Cold Start Idle Air Control System Perform- ance	 Out of range low: Engine speed deviation < -80 RPM Out of range high: Engine speed deviation > 80 RPM 	 Out of range low: Time after engine start > 0.0 s Engine speed, idle Veh speed 0 km/h Altitude < 2,700 m IAT > -48.0° C Catalyst heating active ECT < 143° C Lambda control active EVAP purge adaptation < 22 External torque request active 	• 3.0 – 5.0 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .



DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P050 B	Cold Start Ignition Timing Performance Output Discontinuo in part or in whole, is not continuo in part or in whole, is not continuo in part or in whole is not continuo in part or in whole is not continuo in part or in	Difference between commanded spark timing vs. actual value 30% Note: The command of the comman	Secondary Parameters with Enable Conditions Time during catalyst heating > 12.0 s Commanded spark retard during catalyst heating < 100% Idle speed not active Vehicle speed >= 5 km/h Delta engine load <= 10.01% Delta engine speed <= 100 RPM	• 10.0 s • Once / DCY does not guarar	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to 3:6.34 Throttle Valve Control Module GX3, Checking". page 1169 . Check for any engine speed sensor or ignition coil faults and diagnose them first. If no other codes are set, replace the Engine Control Module - J623 Refer to appropriate repair manual.
		* Elj/1000 ;146;1/1000 /101	Protected SAng	opewsylo / Vaing	indo jugar	

PID52 Cold Start Camshaft Position Timing Over-Advanced - CRK - Canshaft Camshaft	DTC Monitor Strategy Description	teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
The checking", page 1105	A Camshaft Position Timing Over-Ad- vanced	tween target and actual po- sition > 6° CRK	start >= 15.0 s • Engine speed >= 0 RPM • Modeled oil temperature >= -13° C • Catalyst heating active		tagen AG does not	gine oil for incorrect viscosity or in need of servicing (dirty oil). Oil that is not clear in color may be causing the sensor to operate incorrectly. The engine oil must be clean and of the correct viscosity in order for the sensor to operate properly. Check the vehicle paperwork to determine what oil viscosity has been used and when the last oil change was performed. Change the engine oil if necessary.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Cold Start Fuel Pres- sure Per- formance	Difference between target pressure vs actual pressure: > 1.50 MPa Or < -1.50 MPa	 Time after engine start 3.0 s Fuel cutoff not active Catalyst heating active 	• 3.0 s	• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/ or to appropriate repair manual.
						- Check the Fuel Pressure Sensor - G247 - Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 - Checking", page 1131 .
101/08/11/11/65	untessaumorised by	Volkswagen AG. Volksw	agen AG does not guarantee or	Ccept and liability w.		- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129
160000	ECM Processor Fault	ECM internal check failure or BARO fail- ure (located in the ECM)	Key on or engine running	• 2.0 s	• 2 DCY	 Replace the Engine Con- trol Module - J623 Refer to appropri- ate repair manual.
_	Internal Control Module Fuel Injec- tor Control Perform- ance	Internal logic failure	• Engine speed > 80 RPM	· ·	• 2 DCY	 Replace the Engine Con- trol Module - J623 Refer to appropri- ate repair manual.
128	Control Module Fuel Injec- tor Control Perform- ance	Protected by	. DA nagenveylo V ve majive oc	ing the Service of th		

		Nolkswagen	THE TOTAL CONTROL OF THE TOTAL			<u> </u>	
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Con- ditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P0634 Portposes, in part or in whole, is not be been been been been been been been	ECM Inter- nal Temper- ature Too High	Power stage temperature > 150° C	• Engine speed > 80 RPM	• Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .	
orcomme	Throttle Actuator Control Range/ Performance	 Time to close to reference point > 0.6 s And Reference point 2.88% TPS 1 signal 0.40 - 0.60 V TPS 2 signal 4.20 - 4.60 V TPS 1 and TPS 2 4.82 - 5.18 V 	 Engine speed 0 RPM Vehicle speed 0 km/h ECT > 5.3 - 114.8° C AT > 5.3 - 143.8° C Engine shutoff time 5.0 s Number of checks = 2 	• 0.3 – 5.0 s	Torman	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169 .	
P0641	Sensor Reference Voltage A Circuit Open	Signal voltage deviation > +/- 0.3 V		• 0.5 s	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual. 	
P0651	Sensor Reference Voltage B Circuit Open	Signal voltage deviation > +/- 0.3 V		• 0.5 s	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual. 	

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0657	Actuator Supply Volt- age Circuit Open	• Signal voltage > 4.4 – 5.6 V	Secondary Parameters with Enable Conditions Relay commanded off Engine speed > 80 RPM Relay commanded off Relay commanded off	• 0.5 s	• 2 DCY en AG. Volkswage	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271 , Checking", page 1145 .
P0658	Actuator Supply Volt- age Circuit Low	l Ciginal Follage	ded off • Engine speed > 80 REM			- Check the Motronic Engine Control Module Power Supply Relay - J271- Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145.
P0659	Actuator Supply Volt- age Circuit High	• Signal current > 1.1 A	 Relay, commanded on Engine speed > 80 RPM 	0.5 s	o 2 DCY	Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271 , Checking", page 1145 .
P0697	Sensor Reference Voltage Circuit Open	Signal voltage deviation > +/- 0.3 V		• 0.5 s	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 Refer to appropriate repair manual.

		Es ac					
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P117 A	Bank 1 Sensor 2 Control Limit Reached	I portion of 3rd lambda con- trol loop > 0.030	• Engine speed 1,200 – 4,000 RPM • Modeled exhaust gas temp 350 – 1,000° C Engine load 21.8 – 99.8% • 1st, 2nd, 3rd lamb- da control in closed loop • O2S rear and heater ready, no faults	• 1,800.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.	
P12A 1	Fuel Rail Pressure Sensor In- appropri- ately Low	 Pressure control activity > 0.20 MPa Fuel trim activity < 0.80 Difference between actual pressure vs target pressure -16.38 – 16.38 MPa 	600 RPM	• 5.0 s	• 2 DCY	- Check the Fuel Pressure Sensor - G247- Refer to 3.6.16 Fuel Pressure Sensor G247, Checking", page 1131.	
P12A 2	Fuel Rail Pressure Sensor In- appropri- ately High	 Pressure control activity < -0.05 MPa Fuel trim activity > 1.65 Difference between target pressure and actual pressure -16.38 – 16.38 MPa 	 Engine speed > 600 RPM EVAP purge adaption < 22.0 ECT >= 63° C IAT < 90° C Lambda control closed loop Fuel cutoff not active 	• 5.0 s	• 2 DCY	- Check the Fuel Pressure Sensor - G247 - Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131.	

DTC	Monitor Strategy Description		Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P12A 4	· ·	Fuel trim ac-	 Engine speed > 600 RPM EVAP purge adaption < 22.0 ECT >= 63° C 	• 5.0 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 - Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 - Checking", page 1129 Check the Fuel Pressure Sensor - G247 - Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 - Checking", page 1131 -
P13E A	Cold Start Ignition Timing Per- formance Off Idle	timing vs. actual value > 40%	lyst heating > 12.0 s • Commanded spark retard during catalyst heating < 100% • Idle speed not active • Vehicle speed >= 5 km/h • Delta engine load <= 10.01% • Delta engine speed <= 100			- Check for any Engine Speed sensor or Ignition Coil faults and diagnose them first. If NO other codes are set, replace the Engine Control
		o arcial purposes, in part o	RPM	Project	- ĐA nagswa	J623 Refer to appropriate repair manual.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P150 A	Engine Off Timer Per- formance	Difference between engine off time and ECM after run time < -12.0 s or > 12.0 s Mass authorised by Volkswa	after run time ac- tive		• 2 DCY	- If ignition off B+ is lost to ECM, this code will set. Check power and ground inputs to ECM first. Refer to Wiring Diagrams for pin locations. If all power/ grounds to ECM are present, replace the Engine Control Module - J623 Refer to appropriate repair manual.
P1609	Crash Shut Down Was Deployed	Airbag was activated		• Continuous	to the correctness of information in this	- After proper repair of damage, erase the Engine Control Module - J623- DTC. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21 .
P169 A	Vehicle in Transport Mode	Transport mode active	ord - DA nagsw	• 0.0 s	• DCY	 Vehicle is in Transport Mode (Loading Mode). It can be turned off with a scan tool or will automatically switch off after approximately 100 km (62.15 miles) have accumulated on the vehicle. May need to perform readiness check. Refer to ⇒ "3.2 Readiness Code", page 14

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
b500 bart or in part or in who 89.	Intake Manifold Runner Control Cir- cuit Open	• Signal voltage 4.70 – 5.40 V	Tumble flap commanded off Engine speed > 80 RPM Particle of the state of the sta	• 0.5 s	DCY 2 Depect to the correctness of information in the correctness of t	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.
	TEALCH OF CHILDOO 74	Protected by copyrig	-DA nagswaylo V VdY	Oukdoo ilaukoo		- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336. Checking", page 1137.
P2009	Intake Manifold Runner Control Cir- cuit Low	• Signal voltage 0 – 3.26 V	 Tumble flap commanded off Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316. Checking", page 1135 Check the Intake Manifold Runner Position Sensor - G336 Refer to 150 Runner Position Sensor - G356-
						⇒ "3.6.19 In- take Mani- fold Runner Position Sensor G336, Checking", page 1137.

DTC	Monitor	Malfunction Cri-	Secondary Parame-	Monitoring	MIL Illumina-	Component Di-
	Strategy Description	teria and Thresh- old Value	ters with Enable Con- ditions	Time Length	tion	agnostic Proce- dure
P2010	Intake Manifold Runner Control Cir- cuit High	• Signal current > 2.20 A	manded on	• 0.5 s	• 2 DCY	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.
			O SPANIA TO BUILDO JUGUADOO KA POAS			- Check the Intake Manifold Runner Position Sensor - Refer to 3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137.
P2014	Intake Manifold Runner Po- sition Sen- sor Circuit	• Signal voltage > 4.75 V		• 0.3 s	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336- Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137.
						- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316 , Checking", page 1135 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
P2015	Manifold Runner Po-	Deviation runner flap target position vs actual position > 25% Actual position 0 3400% Signal voltage	• Flap commanded on or off • Adaptation ready Nagen AG. Volkswagen AG of		nformat	Valve - N316 Refer to ⇒ "3.6.18 In- take Mani-
P2016	Intake Manifold Runner Po- sition Sen- sor Circuit Low	Signal voltage Cool Republication in the second se	Brotect Protect	• 0.3 s	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137 Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2088	A Camshaft Position Ac- tuator Con- trol Circuit Low	• Signal voltage 0 – 3.25 V	Camshaft valve off Engine speed > 80 RPM	• 0.5 s	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 . Checking". page 1107 . - Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1
P2089	A Camshaft Position Ac-	Signal current > 2.2 A	Camshaft valve on	• 0.5 s	• 2 DCY	N205, Checking", page 1105
	tuator Con- trol Circuit High		• Engine speed > 80 RPM	gen AG. Volksw	agen AG does not	Position Sensor - G40 Refer to
			Camshaft valve on Engine speed > 80 RPM RPM Sellies authorised by Volkswa Sellies authorised by Volkswa Sellies authorised by Volkswa Sellies authorised by Volkswa Sellies authorised by Volkswa			2 ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107
		or in whole, is not on				- Check the Camshaft Adjustment Valve 1 - N205 Refer to
		ocial purposes, in part	Standa Collingo Mondo Va Delos			- Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205. Checking". page 1105.
		omme.	a and the second			mation in this go
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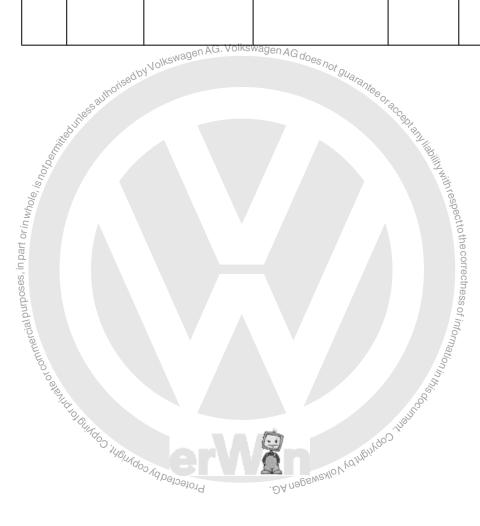
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2096	Post Cata- lyst Fuel Trim Sys- tem Too Lean	Deviation lambda con- trol < -0.03	Modeled exhaust gas temp 450 – 850° C Exhaust gas mass flow 14 – 300 kg/h Lambda control in closed loop, not at min or max limit O2S front ready, no DTC O2S rear ready, no DTC O2heaters active Not in fuel cutoff, SAI off Catalyst heating not active	• 45.0 s	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. - Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to "3.6.25" Oxygen Sensor 1 After Catalytic Converter Catalytic Converter GX7, Checking", page 1149.
P2097	Post Cata- lyst Fuel Trim Sys- tem Too Rich	Integral part of lambda control > 0.03% Integral part of lambda control	 Modeled exhaust gas temp 450 – 850° C Exhaust gas mass flow 14 – 300 kg/h Lambda control in closed loop, not at min or max limit O2S front ready no DTC O2S rear ready no DTC O2S rear ready no DTC O2 heaters active Not in fuel cutoff SAI off Catalyst heating 	• 45.0 s	• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. Check the Oxygen Sensor 1 After Catalytic Converter -

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2101	tuator Con- trol Motor Circuit Range/Per- formance	 Duty cycle > 80% Deviation throttle value angles vs. calculated value 4 - 50% ECM power stage no failure 	an A.G. Volkswa	• 0.5 – 5.0 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169
P2106	Throttle Actuator Control System - Forced Limited Power	• Internal check failed	Duty cycle > 80% or deviation throt- tle value angles vs. calculated value > 4 – 50%	• 0.5 = s no 5.0 s	e 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169
P2122	sor 1/APP Sensor 2	< 0.61 V		• 0.5 s	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 1101.
P2123	APP Sen- sor 1/APP Sensor 2 Circuit D High Input	• Signal voltage > 4.79 V	Moloo Mala beloeford	. 0.5 s	· 2 DCY	Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 1101.
P2127	APP Sen- sor 1/APP Sensor 2 Circuit E Low Input	• Signal voltage < 0.27 V		• 0.5 s	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 1101 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P2128	APP Sensor 1/APP Sensor 2 Circuit E High Input	• Signal voltage > 2.43 V		• 0.5 s	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 1101.	
P2138	APP Sensor 1/APP Sensor 2 Circuit D/E Voltage Correlation	Signal voltage: Difference between signal APP1 and APP2 > 0.17 – 0.70 V	 Signal voltage sensor 1 > 445.0 mv Signal voltage sensor 2 > 445.0 mv 	• 0.24 s	2 DCY agen AG. Volkswa	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking",	
P2146	Fuel Injector Group A Supply Voltage Circuit Open	 Signal current < 2.6 A Or Signal current > 14.90 A 	• Or mlessar	orises	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .	Nee or accept and liberary
P2149	Fuel Injector Group B Supply Voltage Circuit Open	Signal current 14.90 A	 RPM % Or Low side signal current > 2.70 A 		• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.	with respect to the correctr
			, se soummercial purposes,	P. GODNIGNIE	Protection	ON VOIKSWagen AG.	decodian lightin with respect to the correctness of information in this document.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2177	System Too Lean Off Idle	ne > 58%	• Engine speed 1,280 – 6,000 RPM • Engine load 20 – 100% • Mass air flow 30 grad 300 kg/h • ECT 63° C • MAT < 90° C Lambda control closed loop • Evap purge valve closed		en AG does not gua	- Check the fuel pressure and delivery quantity. Refer to fuel system me chanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. - Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 . Check the

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
						Testing", page 1125. Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.



DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2178	System Too Rich Off Idle		• Engine speed 1,280 – 6,000 RPM	• 10.0 s	• 2 DCY	Check the fuel pressure and delivery
			• Engine load 20 – 100%			quantity. Re- fer to fuel system me-
			• Mass air flow 30 – 300 kg/h			chanical test- ing in ⇒ "3.1 Pre-
			• ECT > 63° C			liminary
			• IAT < 90° C			Check", page 13 and/
			Lambda control closed loop			or to appro- priate repair manual.
			Evap purge valve closed			Check the Fuel Injec-
		as authorise	dby Volkswagen AG. Volkswa	gen AG does no	*9uaranteeorace	tors . Refer to ⇒ "3.6.14 Fuel Injec- tors , Check- ing", page 1127 .
			closed loop • Evap purge valve closed Nolkswagen AG. Volkswa		Cantal	- Check the Oxygen Sen- sor 1 Before Catalytic Converter - GX10 Re- fet to ⇒ 3.6.26 Oxygen Sen- sor 1 Before Catalytic Converter GX10, Checking", page 1152.
		The purity of the production of Commercial Purp	Protected by Copy	Wewsgen AG.	Marubindoo ilaan	- Check the Fuel Delivery Unit - GX1- / Fuel Pump
						- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 , Check-

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		orcommercial purposes, in part or in whole, is				ing", page 1139. - Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
P2181	Cooling System Perform- ance	Cooling system temperature too low after a sufficient mass air flow integral 74 – 84° C	 Begin of air mass integration when engine temp > 30° C ECT at start 7 7 - 64° C Ambient air temp -7° C Fuel cutoff not active and engine load 0 - 400% Delta ambient pressure < 1.5 kPa Integrated air mass depending on engine temp at start and ambient air temperature 4 - 23 kg/h Accumulated fuel cutoff < 40.0 - 250.0 s At time of fault decision Average mass air flow 20 - 154 kg/h Average veh. speed 33.4 - 120 km/h 	• 2.0 s	• 5 DCA	- Check the Engine Coolant Temper- dine Coolant Temperature Sensor G62. Checking", page 1117. - Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 - Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 - Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83. Checking", page 1119. - Check the After-Run Coolant Pump - V51 - Refer to ⇒ "3.6.2 After-Run Coolant Pump V51. Checking", page 1103. - Check the engine coolant thermostat. Refer to appropriate repair manual.

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DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2184	Engine Coolant Tempera- ture Sensor 2 Circuit Low	• ECC. 147/s) onthercial purposes, in part or in whole, is, not to the control of		• 2.0 s	• 2 DCY	- Check the Engine Coolant Temperature Sensor Outlet - G83- Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 Checking", page 1119
P2185	Engine Coolant Tempera- ture Sensor 2 Circuit High	• ECT outlet < -43° C	Protected by copyrigh	• 2.0 s	· 2 DCY	- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 . Checking", page 1119 .
						- Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117.

DTC Monitor Strategy Description D
PECT > 63° C Path part load adaptation ready Lambda closed loop PEVAP purge valve closed Page 13 and or to appropriate repair manual. Check the Fuel Pressure Sure Sensor G247. Refer to 5 — "3.6.16 Fuel Pressure Sure Sensor G247. Refer to 5 — "3.6.14 Fuel Injectors. Refer to 2 — "3.6.14 Fuel Injectors. Refer to 3 — 3.6.14 Fuel Injectors. Refer to 7 — 3.6.14 Fuel Injectors. Refer to 8 — 3.6.16 Fuel Injectors. Refer to 9 — 3.6.16 Fuel Injectors. Refer to 9 — 3.6.16 Fuel
Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152. - Check the Fuel Delivery

Fuel Pur Control N ule - J538 Refer to ⇒ "3.6.13 Fuel Pur Control N ule J538 Testing". page 112 - Check the take Mar fold Sens GX9 - R to ⇒ "3.6.25 take Mar fold Sens GX9 - Ching". page 113 - Check the Roll of the control of the	DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
- Check th take Mar fold Sens GX9 R to ⇒ "3.6.20 take Mar fold Sens GX9, Ching", page 113. - Check the Fuel Presure Regulating Value N276 Fuel Presure Regulating Value Regulating		401/10	kswagen AG. Volkswag	en AG does not gua			Unit - GX1- / Fuel Pump Control Mod- ule - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Mod- ule J538 . Testing", page 1125 .
- Check th Fuel Presure Reg lating Va N276 F to ⇒ "3.6.15 Fuel Presure Reg sure Reg lating Va N278 F to	Mod Votes is mod logical in the logi	55 authorised		Tanie coracte	A any liability with respect to the		⇒ "3.6.20 In- take Mani- fold Sensor GX9, Check-
Book Market Montage State of the State of th	on commence of commence of the				ne correctness of information in this occ.,		⇒ "3.6.15 Fuel Pres- sure Regula- tor Valve

P2188 System Too Adaptive value < -5.02% Engine speed 520 10.0 s 2 DCY -1,200 RPM Engine load < 17 - 45% Engine load < 17 - 45% Mass air flow 5 = 26 kg/h Mass air flow 5 = 26 kg/h
- Check the Intake Manifold Sensor -

		20		V/2		
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	b. tion	agnostic Proce-
	or commercial purposes, in part or in whole, is not be.	old Value	- DA nagewaylo	(Kozufi, Indoor) iudi	Mith respect to the correctness of information in this obog.	ing". page 1139 - Check the Fuel Pressure Regulating Valve - N276 - Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 - Checking". page 1129 - Check the EVAP Canister Purge Regulator Valve 1 - N80 - Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80 - Checking". page 1123

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2195	O2 Sensor Signal Biased/ Stuck Lean Bank 1 Sensor 1	• Delta lambda of 2nd lambda control loop > 0.08	 Modeled exhaust gas temp 450 – 850° C Delta engine load < 35% Exh. gas mass flow 14 – 300 kg/h Lambda control, 2nd lambda control, closed loop O2S front, rear and heaters ready - no fault Fuel cutoff, catalyst heating, SAI - not active 1st lambda control loop not at min or max 2nd lambda control loop active 	• 9.0 s	• 2 DCY	dure - Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152. - Check the Fuel Delivery Unit - GX1-/Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 /Fuel Pump Control Module J538, Testing", page 1125. - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 In- * "3.6.20 I
mercial purposes, in pe	THE	Protected by copyright	DA Negeln A.G.	Julius do Julius de la	correctness of information in this	GX9, Checking". page 1139.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2196	O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sen- sor 1	Delta lambda of 2nd lambda control loop < -0.08	850° CDelta engine load35%	• 95.0 s	• 2 DCY	 Check the Oxygen Sen- sor 1 Before Catalytic Converter - GX10 Re- fer to
			 Exh. gas mass flow 14 – 300 kg/h Lambda control, 2nd lambda control, closed loop O2S front rear 			⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10.
			and heaters ready			Checking", page 1152 . - Check the Fuel Delivery
	VYVO	_{ksw} agen AG. Volkswag	not active 1st lambda control loop not at min or			Unit - GX1- / Fuel Pump Control Mod- ule - J538 Refer to <u>⇒ "3.6.13</u>
A DOSTATION OF THE OFFICE OF THE OFFICE OF THE OFFICE OFFI	ssattonised.		2nd lambda control loop active	A AND LIABILITY		Fuel Delivery Unit GX1 / Fuel Pump Control Mod- ule J538 , Testing", page 1125 .
ing, ism				with respect to the co		 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake"
				rrectness of info _{rr}		take Mani- fold Sensor GX9 , Check- ing", page 1139
otot pivate or comme				mation in this cool, in		 Check the EVAP Canis- ter Purge Regulator Valve 1 - N80 Refer
	Ados idionados Na	kswagen AG. Volkswag	DA nagswallo V vo monthingo o ing			to ⇒ "3.6.12 EVAP Canis ter Purge Regulator Valve 1 N80 Checking", page 1123

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2231	O2 Sensor Bank 1 Sen- sor 1 Signal Circuit Shorted to Heater Cir- cuit	Delta O2S signal front > 190 uA	 Engine speed, < 2,700 RPM Engine load < 60% Heater duty cycle, 20 - 80% Modeled exhaust gas temp < 800.1° C Lambda 0.95 - 1.05 Heater control, closed loop, no fault 	• 15.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P2237	O2 Sensor Positive Current Control Cir- cuit Open Bank 1 Sen- sor 1	O2S signal front 1.49 – 1.51 V Delta lambda controller > 0.10	O2S ceramic temp, 715° C Lambda control closed loop Modeled exhaust gas temp > 700° C Lambda modulation > 0.02 Heater control closed loop	• 5.0 - 8.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.
P2243	Reference Voltage Cir- cuit Open Bank 1 Sen- sor 1	• Q2S signal front > 3.25 V and Internal resistance > 1,000 Ω O2S signal front < 0.30 V and Internal resistance > 1,000 Ω	Heater control active	• 20.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.
P2251	O2 Sensor Negative Current Control Cir- cuit Open Bank 1 Sen- sor 1	 O2S signal front 1.47 – 1.53 V/2 And Internal resistance > 1,000 Ω 	 Modeled exhaust gas temp < 700° C No fuel cutoff > 2.0 s Heater control active 	• 25.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2257	AIR System Control "A" Circuit Low	Signal current Signal current	Secondary Parameters with Enable Conditions Page Pump relay companded off Engine speed > 80 mph			J299 / Sec- ondary Air In- jection Pump Motor V101, Checking",
P2258	Control "A" Circuit High	• Signal current 0.60 – 2.40 A	Pump relay commanded on Engine speed > 80 mph Daylold	• 0.5 s	• 2 DCY mation in this occurrence with the control of the control	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.
P2270	O2 Sensor Signal Stuck Lean Bank 1 Sen- sor 2	 Sensor voltage of <= 0.75 V O2S signal rear < -2.0 mV Enrichment after stuck lean 27.9% 	 Mass air flow 25 – 150 kg/h Modeled exhaust gas temp > 350° C O2 readiness > 30.0 s 2nd lambda control closed loop 	• 95.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2271	O2 Sensor Signal Stuck Rich Bank 1 Sen- sor 2	 Sensor voltage of >= 0.15 V After oxygen mass flow > 3,000 mg Number of checks >= 1 	 Time of fuel cutoff <= 90.0 s Time after last fuel cutoff >= 20.0 s O2 rear ready Exhaust temp at sensor >= 385° C Exhaust mass flow > 12 kg/h Exhaust mass flow dynamic within range -80 - 80 kg/h 	• 10.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P2274	O2 Sensor Signal Stuck Lean Bank 1 Sen- sor 3	Sensor voltage of <= 0.70 V O2S rear signal not oscillating at reference < 0.62 – 0.65 V Enrichment after stuck lean 27.9%	Mass air flow 25 – 150 kg/h O2S rear readiness ≥ 30.0 s AG do Modeled exhaust gas temp > 350° C 2nd lambda control closed loop	as not guarant	*CCRDI RIVILIANI	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
	O2 Sensor Signal Stuck Rich Bank 1 Sen- sor 3	O2S sensor voltage >= 0.15 V After oxygen mass flow (fuel cutoff) > 4,500 mg Number of checks >= 1	 Time of fuel cutoff <= 90.0 s Time after last fuel cutoff >= 20.0 s O2S rear ready Exhaust temp at sensor >= 385° C Exhaust mass flow > 12 kg/h Exhaust mass flow dynamic within range -80 - 80 kg/h Sensor voltage at start of measurement > 0.46 V 		• 2 DCY 2 DCY • 2 DCY	- Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sen- sor 1 After Catalytic Converter GX7, Check- ing", page 1149 .

					I	
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2279	Intake Air System Leak	Threshold to detect a defective system > 1.33 – 1.60	 Time after engine start > 60.0 s Engine load < 40% Mass air flow < 6,553.50 kg/h ECT > 49.50° C IAT < 99.80° C Lambda control value > 0.95 Lambda set value 0.95 - 1.05 Veh speed < 1 km/h Lambda control active Engine speed – idle Altitude < 2,700 m O2S front – no fault 	• 23.0 s	• 2 DCY	- Check for air leaks near the throttle body, oil fill cap not tight or oil dipstick not seated in tube. Also check for any engine gaskets that can cause additional air to enter the crankcase can set this fault as the PCV system is not metered. If a vacuum leak or crankcase seal is the cause, the idle may be rough or unstable.
		And the of commercial purposes, in part or in whole, is not being the part of in whole, is not being the part of in whole is a part of in whole is a part of the p	authorised by Volkswagen AG. V	olkswagen AG	does not guarantee	Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to 3.6.12

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
						Checking", page 1123 .
P2293	Fuel Pres- sure Regu- lator 2 Per- formance	Difference between target pressure vs actual pressure: > 1.50 MPa Or < -1.50 MPa	 Time after engine start 10.0 s Fuel cutoff not ac- tive 	• 3.0 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
P2294	Fuel Pressure Regulator 2 Control Circuit	 Signal voltage 1.40 – 3.20 V Or Signal pattern incorrect 	Fuel pump commanded on	• 0.5 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
	Fuel Pressure Regulator 2 Control Circuit Low	• Signal voltage 1.40 – 3.20 V	Fuel control valve commanded off	• 0.5 s	2 DCY 2 DCY 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
	Euel Pressure Regulator 2 Control Circuit High	• Signal voltage > 3.20 V	Fuel control valve commanded On	· 0.5 s	• 2 DOs information in this document	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 , Checking", page 1129 .

DTC	Monitor	Malfunction Cri-	Casandan / Darama	Maniforina	MIL Illumina-	Component Di
ыс	Strategy Description	teria and Thresh- old Value	Secondary Parame- ters with Enable Con- ditions	Monitoring Time Length	tion	Component Diagnostic Procedure
P2300	Ignition Coil A Primary Control Cir- cuit Low	• Signal current > 24.0 mA	• Engine speed > 680 RPM	• 2.0 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage , Checking", page 1133 .
P2301	Ignition Coil A Primary Control Cir- cuit High	> 5.1 – 7.0 V	680 RPM	• 2.0 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
Whole :	cuit Low	3,24.0 mA	680 RPM	• 2.0 s • Contin-	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 .
P23044 Paul burboses, in part	Ignition Coil B Primary Control Cir- cuit High	Signal voltage > 5.1 – 7.0 V	680 RPM	• 2.0 s • Continuous	• 2 2 2 2 1 Information in this	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 .
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DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2306	Ignition Coil C Primary Control Cir- cuit Low	• Signal current > 24.0 mA	• Engine speed > 680 RPM	• 2.0 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage , Checking", page 1133 .
P2307	Ignition Coil C Primary Control Cir- cuit High	• Signal voltage > 5.1 – 7.0 V	680 RPM	• 2.0 s	 Continuous 2 DCY wagen AG does no 	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage Checking", page 1133
P2309	Ignition Coil D Primary Control Cir- cuit Low	• Signal current > 24.0 mA	• Engine speed > 680 RPM	• 2.0 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 Check the Ignition Coils with Power
P2310	Ignition Coil D Primary Control Cir- cuit High	> 5.1 – 7.0 V	Engine speed > 680 RPM Political Pol	• 2.0 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17.1gnition Coils With Power Output Stage . Checking", page 1133 .
P2400	Evaporative Emission System Leak Detec- tion Pump Control Cir- cuit Open	• Signal voltage > 4.4 – 5.6 V	 LDP commanded off Engine speed 80 RPM 	• 0.5 s.	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 , Checking", page 1143 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2401	Evaporative Emission System Leak Detec- tion Pump Control Cir- cuit Low	• Signal voltage > 2.15 – 3.25 V	 LDP commanded off Engine speed 80 RPM 	• 0.5 s	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P2402	Evaporative Emission System Leak Detec- tion Pump Control Cir- cuit High		on	• 0.5 s	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
	Evaporative Emission System Leak Detection Pump Sense Circuit Open	• Low signal voltage > 0.5 s	 Time after engine start 5.0 – 65,530.0 s ECT 5 – 120° C ECT at start 5 – 50° C Engine off time > 21,600.0 s Altitude < 2,700 m Integrated purge flow > 12 g Restart temp diff > 21,600.0 s 	ent. Coprignto.	CC D. The correctness of information in this of the correctness of information in the correctness of i	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame-	Monitoring MI Time Length	IL Illumina- tion	Component Diagnostic Procedure
P2404 Commercial purposes, in part or in whole, is not become or in part or in whole, is not because of the part o	Evaporative Emission System Leak Detection Pump Sense Range/Performance	• High signal voltage > 12.0 s • Number of checks = 30	 Time after engine start 12.0 – 65,530.0 s Engine off time > 21,600.0 s ECT 5 – 120° C ECT at start 5 – 50° C Ambient air temp 5 – 59° C Altitude < 2,700 m Intake manifold vacuum > -2,560 hPa Restart temp diff > 0 K Veh speed >= 0 km/h Veh speed ones > 30 km/h Any drive gear EVAP purge valve ready, no faults LDP commanded off 	• 12.0 - s • Once / North respect to the correctness of information in this contract to the correctness of the correctness of information in this contract to the correctness of information in the correctness of the correctness of information in the correctness of	2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P2407	Evaporative Emission System Leak Detec- tion Pump Sense Cir- cuit Inter- mittent/Er- ratic	 Fluctuation of EVAP pump current during reference measurement engine off > 2.0 mA Or Drop of EVAP pump current during pump phase of 3.0 s > 6.0 mA 	 ECT @ start >= 4° C Difference between ECT and IAT @ start <= 15 K Engine off time >= 5.0 s Airbag not activated 	• 800.0 s	2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .

	DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
'in whole, is	P240	ssauthorised by Vo	 Fluctuation of EVAP pump current during reference measurement 2.0 mA Or Drop of EVAP pump current during pump phase of 3.0 s > 6.0 mA Signal voltage 	 Intake manifold vacuum > 30 kPa Delta vehicle speed < 16 mph RPM > 20 RPM Front OS2 ready EVAP pump heat- 	• 19.0 s	• 2 DCY	Check the
unmercial purposes, in part or	A		> 4.70 – 5.40 V	er commanded off	the correctness of informatio		Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
	P240	THOO THOUNDOONG	• Signal voltage < 2.74 – 3.26 V	EVAP pump heater commanded Off Parkennsdeu Verlühren verschaften verscha		• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
	P240 C		• Signal current > 2.2 – 4.0 A			• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.

	Generic Sc	an Tool - Edition 12	2.2017			
DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2414	O2 Sensor Exhaust Sample Er- ror Bank 1, Sensor 1	 Threshold 1 Signal voltage 3.1 – 4.81 V Threshold 2 O2S signal 2.5 – 3.2 V 	 Lambda set value < 1.6 Fuel cut off not active Heater control closed loop SAI not active O2S ceramic temp > 720° C If low fuel signal then wait > 0.0 s 	• 15.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P2431	Secondary Air Injection Sensor Per- formance	pressure sensor and ambient pressure NOT -60.0 – 60.0 hPa	art or in whole, is not on the season of the	• 0.5 s	• 2 DCY	- Check the Secondary Air System - GX24 - Refer to ⇒ "3.6.32 Secondary Air System GX24 , Checking", page 1165 . AG For Beetle or 2013 = 2014 Jetta, check the Secondary Air Injection Sensor 2 - G610 - Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610 . Checking", page 1161 .
			in personal purposes in personal purpose in personal purp	ofected by copy	G. Pr	Jetta, checken the Secondary Air Injection Sensor 2 - G610 Refer to Sensor 2 G610 - Checking". page 1161 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Secondary Air Injection Sensor Cir- cuit Low	• Signal voltage < 0.40 V		0.5 sContinuous	• 2 DCY	- Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 . Checking", page 1165 .
oart orinwhole, is hot bemitte.	unless authorised by	Volkswagen AG. Volksw	ragen AG does not guarantee or o	ccedtanyliability with respect to most		- For Beetle or 2013 - 2014 Jetta, check the Secondary Air Injection Sensor 2 - G610 Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610, Checking", page 1161 .
	Secondary Air Injection Sensor Cir- cuit High			• 0.5 s • Contin-ormation in the continuous		- Check the Secondary Air System - GX24 · Re- fer to ⇒ "3.6.32 Secondary Air System GX24 · Checking", page 1165 ·
	* Olifdo Willindos	Protected by	DA NONKOWAGEN AG.			- For Beetle or 2013 - 2014 Jetta, check the Secondary Air Injection Sensor 2 - G610 Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610 . Checking", page 1161

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2440		SAI pressure sensor vs modeled while SAI valve is closed < 71.1%	 Altitude < 2,700 m SAI press sensor ready no fault 	• 43.5 s	• 2 DCY	- Check the Secondary Air Injection Solenoid Valve - N112- Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112 Checking", page 1163 . - Check the Secondary Air Injection Pump Relay - J299- / Sec-
) (9/Ol				ondary Air Injection Pump Motor - V101 Refer to "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.
P2450	Evaporative Emission System Switching Valve Per- formance/ Stuck Open	EVAP pump current differ- ence between reference measurement to idle < 3.0 mA	tween ECT and IAT @ start <= 15 K • Engine off time >= 5.0 s • Airbag not activated		• 2 DCY	Motor V101, Checking", page 1157. - Check the Leak Detection Pump - V144- Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
		Engine on EVAP pump current differ- ence between reference measurement to idle > 3.0 mA	• Time since last en-	• 4.0 s	Kewagen AG.	ON KAMBIKOO Jisamoo

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MILAIllumina- tion es not	Component Diagnostic Procedure, dure
P2626	O2 Sensor Pumping Current Trim Circuit/ Open Bank 1 Sensor 1	O2S signal front > 4.81 V O2S signal front > 4.81 V O2S signal front > 4.81 V	 Modèled exhaust temp < 700° C O2S ceramic temp > 715° C Fuel cut off active Heater control closed loop No low fuel signal 	• 1.5 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter GX10- Resor 1 Before Catalytic Oxygen Sensor 1 Before Catalytic Converter GX10- Checking", page 1152 - Check the Engine Coolant Temper-
P3081	Engine Tempera- ture Too Low	Cooling system temperature < 74° C – 84° C after AAT check	Search of Burgoo subjustice of the subjustice of	• 4.0 s	• 2 DCY	ature Sensor - G62 Refer to ⇒ "3.6.9 En gine Coolant Temperature Sensor G62, Checking", page 1117 .

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U000 1	High Speed CAN Com- munication Bus	CAN mes- sage, no feed- back	Time after ignition on 500.0 ms	• 250.0 ms	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
U000 2	High Speed CAN Com- munication Bus Per- formance	Out failure	Time after ignition on 500.0 ms en AG. Volkswagen AG does /	• 450.0 ms	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
U010 1	Lost Communication with FCM whole or in part or in monological part of the commercial part of the communication with the commercial part of the commercial part	Time Out failure. No message received by ECM	Time after ignition on 500.0 ms	• 500.0 ms	Y with respect to the correctness of information,	- Check the CAN-Bus terminal resistance between the Transmission Control Module and the Engine Control Module - J623 - Refer to 3.6.6 CAN-Bus Terminal Resistance, Powertrain, Checking", page 1112 .
U012 1	Lost Com-	• CAN communication with ABS Time Out - no message	• Time after ignition on 500.0 ms	• 500.0 ms	• DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109.
U014 6	Lost Com- munication With Gate- way A	CAN communication with gateway Time Out - no message	Time after ignition on 500.0 ms	• 500.0 ms	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109.

DTC	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U015 5	Lost Com- munication With Instru- ment Panel Cluster (IPC) Con- trol Module	No CAN messages received	Time after ignition on 500.0 ms	• 2,000 ms	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109.
U030 2	Software In- compatibili- ty with Transmis- sion Control Module	AT vehicle ECM coded as MT vehicle	Time after ignition on 500.0 ms	• 5,000 ms	• 2 DCY	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module. Refer to appropriate repair manual.
U040 2	Invalid Data Received From Gear Shift Con- trol Module A	Transmission Data implausible message Output Data implausible message Output Data implausible message	Time after ignition on 500.0 ms	• 60.0 ms	• 2 DCY	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module. Refer to appropriate repair manual.
U041 5	CAN Com- munication With ABS Error	Speed sensor initialization failed Speed sensor low voltage error failed Implausible message received on the sensor low voltage.	Time after ignition on 500.0 ms	• 50 – 2,100 ms	• 2 DCY	- Check the CAN Bus terminal resistance. Refer to 3:6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
U042 2	Invalid Data Received From Body Control Module (IPC)	Ambient tem- perature value initialization failure	Status ambient temperature from instrument cluster no fault Electrical check ambient temperature sensor no fault	. DA nagewa	· 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P000 A "A" Cam- shaft Posi- tion Slow Re- spons e Bank 1	Strategy Description VVT Actua- tor Intake Rationality Check	• Adjustment angle difference >= 3.0; < 15.0° CRK	ters with Enable	Time Length • 300.0 s • Continuous	• 2 DCY	agnostic Proce-
	¹ 46140	Protected by co	DA nagewaylo V to Inging		2 Di	nosis and Testing 1

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0010 "A" Cam- shaft Posi- tion Actua- tor Con- trol Cir- cuit/	VVT Actua- tor Intake Open Cir- cuit	Output voltage lower range 1.92 – 2.21 V Output voltage upper range (hardware values) 2.85 – 3.25 V	Actuator com- manded off	• 2.0 s • Continuous	• 2 DCY	- Check the Engine Speed Sen- sor - G28 Refer to ⇒ "3.6.11 Engine Speed Sen- sor G28 , Checking", page 1121 .
Open Bank 1	wrposes, in part or in whole, is not be	Stilled thouse authorised by Vo	_{iksw} agen AG. Volkswagen A	G does not guar	antee of acceptent lighting	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 . - Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 Checking", page 1105 .
	or commercial I	PRAILE TO STUDING OO NO	AG. Protected	¹ DA A OIKEMSDEN	J. B. H. GO. J. Baltodo J. Baltod	information .

is not best milities	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
ommercial purposes, in part or in whateor or in whateor commercial purposes, in part or in whateor	"A" Cam- shaft Posi- tion - Tim- ing Over- Ad- vance d or Sys- tem Per- for- manc	VVT Actuator Intake Rationality Check	• Camshaft position deviation > 10.0° CRK	 Modeled oil temperature -40 – 160° C Engine speed 608 – 6,016 RPM Camshaft position n.a. Camshaft position adjustment active Catalyst heating not active 	• Continuous • Contectness of Information In.	• 2 DCY	 Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121. Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107. Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 Checking", page 1105.

DTC / Monito De- scrip- tion Strateg Descripti	teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0016 Crank shaft Position/ Cranksha Position - Cam- shaft Position Adaptatio Value Motoring Torrelation Bank 1 Sensor A	for each edge of the target wheel < -14.0 CRK	ment (exhaust side) active • Engine speed 288 – 4,000 RPM • Modeled oil temperature >= -15° C • Modeled oil temperature <= 160° C • Engine speed < 8,160 RPM • Diff. actual exhaust camshaft position vs. previous camshaft position vs.	• 720.0° CRK • Multiple	• 2 DCY	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121 Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40. Checking", page 1107 Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205. Checking", page 1105.

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	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
part or in whole, is not be	HO2S Heat- er	Oxygen Jokes Sensors Heater Front Open Circuit	• O2S up- stream heater voltage lower range 1.92 – 2.21 V • O2S up- stream heater voltage upper range 2.85 – 3.25 V	AG does not guarantee or accept	2.5 s Continuous MANUALINAMIN respect to the correct to	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10 . Checking". page 1152 .
ot commercial purposes, in part or in whole, is not	HO2S Heat- er Con- trol Circuit Low Bank 1 Sen- sor 1	Oxygen Sensors Heater Front Short To Ground	O2S up- stream heater voltage < 1.92 – 2.21 V	aurdo ilai	• Continuous information in this cool	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 .
	HO2S	Oxygen Sensors Sensors Heater Front Short To Battery Plus	O2S up- stream heaten driver temper- ature > 160.0 to 200.0° C Or O2S up- stream heater driver output current > 8.0 to 12.0 A	• Actuator commanded on	• 2.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 .
	Tur- bo- charg-	Turbo- charger De- celeration Bypass Valve Open Circuit	 Voltage lower range 1.92 – 2.21 V Voltage upper range 2.85 – 3.25 V (hardware values) 	Actuator com- manded off	• 1.0 s • Continuous	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249, Checking", page 1172.
							- Check the Charge Air Pressure Ac- tuator - V465 Refer

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time gen Length	MIL Illumina- AG. Volkswagen	Component Diagnostic Procedure
	Turbo- charger De- celeration Bypass Valve Short To Battery Plus	 Current > 4.0 7.0 A Or Temperature 160 - 200° C (hardware values) 	Actuator commanded on manded on			to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
Tur- bo- charg-	Turbo- charger De- celeration Bypass Valve Short To Ground	Voltage < 1.92	Actuator commanded off A	• 1.0 s • Continuous .	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 - Checking", page 1172 . - Check the Charge Air Pressure Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .
HO2S	Oxygen Sensors Heater Rear Open Circuit	 O2S down-stream heater voltage lower range 1.92 – 2.21 V Or O2S down-stream heater voltage upper range 2.85 – 3.25 V 	Engine not in start process	2.5 sContinuous	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Heat- er	Sensors	O2S down- stream heater voltage ≤ 1.92 – 2.21 V	ters with Enable Conditions Engine not in G. vstart process EGT @ O2S rear	• 2.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
P0038 HO2S Heat- er Con- trol	Oxygen Sensors Heater Rear Short To Battery Plus	stream heater driver temper- ature > 160.0 - 200.0° C	 EGT @ O2S rear (binary) >= 300° C Actuator commanded on Engine not in start process 	• Continuous	e correctness of information in this coo	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
Tur- bo- charg-	charger Boost Pres- sure Con-	Bypass valve driver load re- sistance > 200 kΩ	 Deviation between actual and filtered boost pressure actuator position <= 5.0% Boost pressure actuator controller not active Time delay > 1.0 s 	• 0.408	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249- Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 Checking", page 1172 . - Check the Charge Air Pressure Actuator - V465- Refer
						to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Turbo- charger Out Of Range High	 Turbocharger speed >= 213,000 RPM Or IAT @ throttle >= 336° C For time >= 25.5 s 	Engine running	• 2.6 s • Continuous	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249. Checking", page 1172.
	les authorised by	Jolkswagen AG. Volksw	agen AG does not guarantee o,			- Check the Charge Air Pressure Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .
MAP - Throt- tle Po- sition Corre- lation	Manifold Pressure Sensor Large Leak- age Detec- tion	Diff. MAP set point vs. ac- tual MAP < -15.0 – -10.0 kPa	 Fast throttle adaption finished MAP gradient -200.00 - 200.00 kPa/sec. Vehicle speed <= 2 km/h Time after engine start > 5.0 s Engine speed lower range > 576 RPM 	• Continuous Mith (especies	tto the correctness.	 Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169. Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 In-
SPENIL OF THE SP	Oreinados ineinados	Protected	-48° C ECT @ cylinder block > -48° C Pressure quotient @ throttle 0:10 – 0.60 [-] Load dynamic conditions: Dynamic engine speed < 8,160 RPM Dynamic air mass < 25.01 mg/ rev	THE HITCO		take Mani- fold Sensor GX9, Check- ing", page 1139. - Check the EVAP Canis- ter Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canis- ter Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canis- ter Purge Regulator Valve 1 N80,

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake Air System Ra- tionality Check	Throttle cross-sectional area correction included controller and adaption < -60.0% Lambda correction included controller and adaption -28.0 – 28.0% Lambda controller and adaption adaption adaption active	modeled adaption active (by throttle opening area) Throttle position 0.000 – 100.003° TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] Fast throttle adaption finished MAP gradient -200.0 – 200.0 kPa/s Fuel cut off not active Time after engine start > 5.0 s Boost pressure 73.0 – 107.50 kPa BARO 73.0 –			Checking", page 1123.
Ambi- ent Air Tem-	crit omercial purposes, in part or in whole, is not be in the contract of the	>,4.50 V	107.50 kPa	uous	• 2 DCY	Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking",
		Oilly State of the		owo A Karybi	KIGO Julio	
		·'4/Þəj	Datord DA nag	SeWey.	3. Diagi	nosis and Testing 1

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0071 Ambient Air Ambi- ent Air Tempera- ture Sen- sor Circuit "A" Rang e/Per- for- manc e	 Diff. AAT vs. IAT @ first engine start > 20 K (depending on engine off time) And Diff. AAT vs. ROT @ first engine start > 20 K (depending on engine off time) And Diff. IAT vs. ROT @ first engine start < 20 K (depending on engine off time) 	360.0 m		• 2 DCY	- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148 Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
P0072 CAN: Ambient Air Temperature Sensor Circuit Air Temperat	voltage < 0.10 W.(hardware ^{wa} values)	Gen AG does not guarantes of	od and littly with respect to the consession of	porraphag	 Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148. Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.

is hotborn	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
And the seasan in part or in whole the season of the seaso	P0087 Fuel Rail/ Sys- tem Pres- sure - Too Low Bank 1	Fuel System Pressure Sensor, High Pressure Side Out Of Range Low	Malfunction Criteria and Threshold Value Deviation between reference fuel pressure set point and current fuel pressure > 2,000.10 kPa Case 1: Fuel mass controller output -50.0 - 50.0% High pressure controller output > 30 mg Fuel pressure < 2,500.0 kPa Case 2: Fuel pump at max limit Mass fuel flow set point n.a. Fuel pressure n.a.	n.a.	• Continuous correctness of Information in this co.	• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/ or to appropriate repair manual. Check the Fuel Pressure Sensor G247 - Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131 . Check the Fuel Pressure Regulating Valve N276 - Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve N276 - Checking", page 1129 . Check the Fuel Delivery Unit - GX1 - / Fuel Pump Control Module - J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel Pump Control Module J538 - Refer to ⇒ "3.6.13 Fuel

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel System Pressure Sensor, High Pressure Side Rationality Check Low	Fuel mass controller output -50.0 - 50.0% And High pressure controller output > 35 mg And Deviation between fuel pressure set point and current fuel pressure > 2,000.10 kPa And Fuel pressure >= 2,500.0 kPa	quest for mass fuel flow set point >= 5.0 s • Engine start not active • Time after engine start > 5.0 s • Engine warm-up n.a. • Catalyst heating not active	• 5.0 s • Continuous	OKI SILI SILI SILI SILI SILI SILI SILI SI	GCERT and liability with respect to the correctness of information in this cook.
	Fuel Control Valve Open Circuit	 Voltage high side < 1.87 – 2.26 V Voltage low side > 2.78 – 3.33 V 	 Engine speed 0 RPM Or Fuel cut off active Actuator commanded off 	• 0.0 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 Check the Fuel Pressure Regulator Valve - N276 Refer to

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illu Time Length	
	ndes authoris	 Low and high side off: Voltage low side > 2.78 – 3.33 V Voltage high side < 1.87 – 2.26 V Low and high side on: Current low side < 12.2 – 15.0 Apan AG. Voltage AG. AG. Voltage AG. Voltage AG. Voltage AG. Voltage AG. Voltage AG. AG. Voltage AG. AG. Voltage AG. AG. Voltage AG. Voltage AG. AG. AG. Voltage AG. Voltage AG. AG. AG. AG. AG. AG. AG. AG. AG. AG.	 Engine speed > 600 RPM And Fuel cut off not active Actuator commanded on 	Tee Oraco	⇒ "3.6.15 Fuel Pres- sure Regula- tor Valve N276 , Checking", page 1129 .
sure Regu- lator 1 Con- trol	Fuel Con- trol Valve Short To Ground (High Side)	• Current high side > 13.5 – 17.0 A (hard- ware values)	 Ignition on Or Ignition off (during ECM keep alive-time) And Actuator commanded on Ignition on Or 	O.2 s Continuous	CY - Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 Check the
Imo io	Ground (Low Side)	Voltage low side < 1.87 – 2.26 V (hardware values) Current low side > 13.5 –	Ignition off (during ECM keep alive-time) And Actuator commanded off One was a series of the commanded off Ignition on	AlfOD JATOS ON THE PROPERTY OF	Fuel Pressure Regulator Valve - N276 - Referto ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
P0092 Fuel Pres- sure Regu- lator 1 Con- trol Circuit High	Fuel Con- trol Valve Short To Battery Plus (Low Side)	Current low side > 13.5 – 17.0 A (hard- ware values)	 Ignition on Or Ignition off (during ECM keep alive-time) And Actuator commanded on 	• 0.2 s • Continuous	CY - Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Control Valve Short To Battery Plus (Eigh Side)	Voltage high side < 2.78 – 3.33 V (hard- ware values)	 Ignition on Or Ignition off (during ECM keep alive-time) And Actuator commanded off 		, respect to the correctness of information	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
P00A F Tur- bo- charg- er/Su- per- charg- er Boost Con- trol	Turbo- charger Boost Pres-	98.0% Boost pressure actuator	 Time after engine start >= 4.0 s ECT > -40° C AAT > -40° C Catalyst heating not active Boost pressure control active 	Contin- uous	· 2 DCY	- Check the Charge Air Pressure Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .
"A" Mod- ule Per- for- manc e	Turbo- charger Boost Pres- sure Con- trol Valve Functional Check	Deviation boost pres- sure actuator position con- troller > 12.0 – 100.0%				
Mass	Mass or Volume Air Flow Sen- sor "A" Cir- cuit	• MAF sensor signal 0 µs	• Engine speed > 20 RPM	• 0.2 s	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Mass or Vol- ume Air	Mass or Volume Air Flow Sen- sor "A" Cir- cuit Range/ Perform- ance	 Upper threshold model > 60 – 800 kg/h Lower threshold model < 0 – 400 kg/h Load calculation > 18% Fuel system < -18% 	start 150 cam- shaft revolutions Throttle position < 99.6% Engine speed 1,280 – 6,000 RPM	• 2.0 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169 Check the Intake Manifold Sensor - GX9- Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking". page 1139 .
Mass	Mass or Volume Air Flow Sen- sor "A" Cir- cuit Low	• MAF sensor signal < 66 μs	Engine speed > 20 RPM 20 RPM AG. Volks Sedby Volkswagen AG. Volkswagen AG. Volks Sedby Volkswagen AG. Volk	• 0.2 s	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 .
	Mass or Volume Air Flow Sen- sor "A" Cir- cuit High			• 0.2 s	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6-20 Intake Manifold Sensor GX9, Checking",
		MAF sensor signal > 4,500 Signal > 4	Protected by copyrig	wagen AG.		page \$139.

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DTC / De- scrip- tion	Monitor Strategy Description	ategy teria and Thresh-	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
Mani- fold Abso-	Manifold Pressure Sensor Cross Check	Charged engine Diff. BARO vs. MAP > 7.50 kPa Diff. turbo-charger boost pressure vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure <= 7.50 kPa Case 2: Non charged engine Diff. BARO mean value vs. MAP mean value >= n.a. kPa	 Case A: Engine stop during DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle n.a. For time >= 10.0 s Case B: Engine stop @ start of DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle n.a. 			- Check the Intake Manis fold Sensor - GX9-Refer to 3.6.20 In-	with respect to a solid information to

D sci tio	C / e- ip- on	Description	Malfunction Cri⁴a teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Notport	ill diff	,555°	Diff. BARO mean value vs. MAP mean value > n.a. kPa		cedtenyliabilitywith respect to the		
commercial purposes, in part or in whole, is no	B Alla tol.	Strato intervence	 Case 1: Charged engine Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure <= 7.50 kPa Diff. turbocharger boost pressure vs. MAP > 7.50 kPa Case 2: Non charged engine Diff. BARO mean value @ ECM keep alive vs. MAP mean value @ ECM keep alive time > n.a. kPa 	 Engine stopped Vehicle speed < 1 km/h ECM keep alive time 10.0 - 6,553.5 s Time after engine stop >= 5.0 s BARO sensor voltage 0.20 - 4.80 V MAP sensor voltage 0.20 - 4.80 V Boost pressure sensor voltage 0.20 - 4.80 V Boost pressure sensor voltage 0.20 - 4.80 V 	e correcutess of information in this obling the state of		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	tion tion	Component Diagnostic Procedure
	Intake Air System Ra- tionality Check	Throttle opening area correction included controller and adaption > 40.0% Lambda correction included controller and adaption < -28.0% THOMAS THOMAS AS A	modeled adap-	• 5.0 s • Continuous	addition with respect to the correctness of $information$ in f_{his} on G_{ch} and G_{ch} .	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Crin A teria and Thresh- old Value	Secondary Parameters with Enable not Conditions	00.	tion	Component Diagnostic Procedure
P0107 Manifold Absolute Pressure/ Barometric Pressure Sensor Circuit	Sensor Short To Ground	• Intake manifold pressure sensor voltage < 0.20 V	DA nagen Ado	· 0.5 s cag	2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 3 DCY 4 DCY 4 DCY 5 DCY 6 DCY 7 DCY 6 DCY 7 DCY 6 D	- Check the Throttle Valve Control Module GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 . - Check the Charge Air Pressure Sensor - G31- Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31- Checking", page 1115 . - Check the Intake Manifold Sensor GX9- Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9- Checking", page 1139 .



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Manifold Pressure Sensor Short To Battery Plus	sensor volt- age > 4.80 V	olivate of commercial purposes, in part of in who	• 0.5 s	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 , Checking", page 1139 .
1	Intake Air Tempera- ture Sensor Cross Check	 Diff. IAT vs. AAT @ first engine start > 20 K (depending on engine off time) And Diff. IAT vs. ROT @ first engine start > 20 K (depending on engine off time) And Diff. AAT vs. ROT @ first engine start < 20 K (depending on engine off time) 	 Engine off time > 360.0 m/s Decrement check to ensure a cold vehicle state: Diff. IAT vs. min. IAT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s Diff. ROT vs. min. ROT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s Diff. AAT vs. min. AAT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s For time > 20.0 s 	• 100.0 s • Once / DCY	9	- Check the Intake Manifold Sensor - GX9 Refer to 3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 Check the Charge Air Pressure Sensor - G31 Refer to 3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake Air Tempera- ture Sensor Short To Ground	IAT sensor voltage < 0.10 V		2.0 sContinuous	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking". page 1139 Check the Charge Air Pressure Sensor - G31 Refer to
						⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115.
	Intake Air Tempera- ture Sensor Open Cir- cuit	IAT sensor voltage > 4.50 V	sauthorised by Volkswagen Ar	 2.0 s Continuous Nolkswagen 	• 2 DCY	- Check the Intake Manifold Sensor - GX9- Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking". page 1139
		in part or in whole, is not be mile of the	indoo indindoo ka baloado			- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31-, Checking", page 1115
		storphyde or commercial purposes				page 1115 page 1115 page 1116 page 1
		***************************************	Protected by copyright!	.5A	Anageweylo V Kd rhg	intoo in

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0116 En- gine Cool- ant Tem- pera- ture Sen- sor 1 Circuit Rang e/Per- for- manc e	Engine Coolant Tempera- ture Sensor No Change On Signal	• Diff. max. ECT vs. min. ECT < 1.5 K	 ECT range conditions: ECT @ start < 82; > 98° C And ECT @ start n.a. Driving condition H: Engine part load Or Engine full load Engine speed > 1,300 RPM Vehicle speed > 50 km/h Ratio air mass flow > 6.0% Time after conditions are fulfilled > 30.0 - 60.0 s Driving condition L: Engine idle Vehicle speed n.a. Or Fuel cut off active Time after conditions are fulfilled > 30 - 60 s 	• Once / DCY		- Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117. - Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 Refer to Engine Coolant Temperature Sensor On Radiator Outlet G83. Checking", page 1119.
	Engine Coolant Tempera- ture Sensor @ Cylinder Block Ra- tionality Check Inap- propriately Low	Diff. min temperature of cross check sensors vs. ECT @ cylinder block @ engine start >= 10° C	• Cross checks finished	• 1.0 s	OKSMAD VOKSWAG	Tugati Co

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Engine Coolant Tempera- ture Sensor @ Cylinder Block Ra- tionality Check High	ECT @ cylinder block @ engine start > 40 - 80° C authoriseaby Volkswager authoriseaby Volkswager	 Cross checks finished Engine running Engine off time >= 240.00 m Valid AAT signal for time >= 2.0 s Valid engine stop signal for time >= 3.0 s 	of guarantee c		
	Engine Coolant Tempera- ture Sensor @ Cylinder Block Ra- tionality Check Low	Difference be- tween model- led and meas- ured cylinder block temper- ature > 10° C	 ECT @ cylinder block -128 – 127° C Time after engine start > 60.0 s 	• 10.0 s	Ryany liability with resp	
ant	Coolant Tempera- ture Sensor Short To	• ECT sensor voltage < 0.30 V	Kawagen AG.	• 0.5 s • Continuous	You the correctness of information in this cooling.	 Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117 Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119

DTC /	Monitor	Malfunction Cri-	Secondary Parame-	Monitoring	MIL Illumina-	Component Di-				
De- scrip- tion	Strategy Description	teria and Thresh- old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure				
En- gine Cool- ant	Engine Coolant Tempera- ture Sensor Short To Battery / Open Cir- cuit	ECT sensor voltage > 4.90 V	Time after engine start > 60.0 s	• 0.5 s • Continuous	• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor - G62 Refer to ⇒ "3.6.9 En- gine Coolant Temperature Sensor G62, Checking", page 1117 Check the Engine Cool- ant Temper- ature Sensor on Radiator Outlet - G83 Refer to ⇒ "3.6.10				
P0121	Throttle Po-	Normalised	Throttle adaption	Volkswagen AC	. Volkswagen A_G	G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 Checking", page 1119 . Check the Throttle				
Throt- tle/	sition Sen- sor 1 Ra- tionality Check	difference be- tween meas- ured and modeled val- ue of mass air flow from TPS 1 >= 1.00 [-]	not active	Continuous	2 001	Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Con-				
h "A" Circuit Rang e/Per- for- manc						Relative mass air flow inte- gral from TPS 1 > 60.0 [-]	nercial purposes, If			trol Module GX3, Check- ing", page 1169.
е		Difference be- tween TPS 1 and TPS 2 > 6.499° TPS	moo to alkinith to	• 0.3 s • Continuous						
Throt- tle/	Throttle Position Sensor 1 Short To Ground	Throttle position sensor 1 voltage < 0.17 V	sodnot julito ju	• 0.1 s • Continuous	- 5 DCX	- Check the Throttle Valve Con- trol Module -				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0123 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "A" Circuit High	Throttle Position Sensor 1 Short To Battery Plus	Throttle position sensor 1 voltage > 4.83 V		• 0.1 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
P0130 O2 Sen- sor Circuit Bank 1 Sen- sor 1	O2 Sensor Circuit Bank 1 Sensor 1	art orin w	Modeled exhaust temp > 300 °C Fuel cutoff not active	, Ksw42.0 S	oiksward YG do.	Check the Oxygen Sensor 1, Before Catalytic Converter GX10 Re fer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P0131 O2 Sen- sor Circuit Low Volt- age Bank 1 Sen- sor 1	Oxygen Sensors Front Short To Ground	O2S sensor augustus voltage < 0.15 V Sodund leiver V O2S sensor augustus voltage < 0.15 volt	 O2S heater front active Pump current controller active Measurement of WRAF sensor label resistor not active Active phase of open circuit diagnosis for linear lambda sensor not active 	• 0.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1752 .
P0132 O2 Sen- sor Circuit High Volt- age Bank 1 Sen- sor 1	Oxygen Sensors Front Short To Battery Plus	O2S sensor voltage > 5.20 – 5.35 V	 O2S heater front active Pump current controller active Measurement of WRAF sensor label resistor not active Active phase of open circuit diagnosis for linear lambda sensor not active 	• Continuous	• 2 DCY _{UB} OR	Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.

PO133 Oxygen O2 Sensors Sor Circuit Check Show Re spons e Sand Show Respons e Sor Circuit Check Show Respons e Sensor Show Respons e Sensor Response Response e Sensor Response Respon
speed < 150 RPM Dynamic MAF < n.a. mg/rev Or

DTC / De- scrip- tion	Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Of Definition			Dynamic MAF per segment < 30.0 kg/h	AM ladility with resp		
hole, isr			• Dynamic lambda < n.a. %	lith resp		
part or in w			Change of dy- namic torque < 0.07 [-]		ct to the co	
of commercial purposes, in part or in whole, is not being,			 CONDITIONS RANGE 2: (Diagnosis carried out together with the catalyst efficiency diagnosis) 	····O/ma	he correctness of inc	
Borcom			General conditions	ttioninth		
*6714	010		 Vehicle speed >= 10 km/h 	""omation in this cook the st.		
	O. S.	Protectedby	Barometric pres- sure n.a. Catalyst over- heating protec- tion not active			
			O2S rear ready			
			O2S front ready			
			O2S front pump current valid			
			O2S heater rear active			
			Integrated heat energy >= 1,600.0 to 3,000.0 kJ			
			• Or			
			• Time after engine start > 230.0 – 1,000.0 s			
			• Engine speed 1,280 – 3,008 RPM			
			Lambda control value < 50.0%			
			• Lambda control- ler deviation < 0.08 – 0.15 [-]			
			• Or			
			Counter lambda controller devia- tion > 1.00 [-]			
			Quickpass trim control ready			

DTC / De-	Monitor Strategy	Malfunction Cri- teria and Thresh-	Secondary Parameters with Enable	Monitoring MIL II	lumina- Co	omponent Di- nostic Proce-
scrip-	Description	1 1 1 1 1 1	A 1141			
	MI OCT		• Or	a de la companya de l		
	m part orin whole, is hotbern		 Conditions Or Trim control with high demand of adaptation proportional part of trim control < 0.25 [-] Lambda adaptation commanded off Scavenging not active Valve lift not active Time after a catalyst purge phase >= 0.02 s Temperature conditions ECT > 60° C IAT > -48° C Modeled catalyst temp. 500 – 700° C Modeled catalyst temp. extended 		threspect to the c	
			 Lambda adapta- tion commanded off 		orrectness	
	ercialpu		 Scavenging not active 		of inforn	
	or comm		Valve lift not active		nation.	
	SEATING TO TOWN		 Time after a catalyst purge phase >= 0.02 s 	LIN DE STATE		
		Protected by copyright, Co	 Temperature conditions ECT > 60° C ANSW 	Vydrių ivgo		
		Protecto	• IAT > -48° C			
			 Modeled catalyst temp. 500 – 700° C 			
			 Modeled catalyst temp. extended range 470 – 730° C 			
			 Difference be- tween dynamic and stationary catalyst temp. -254.0 – 254.0 K 			
			 Difference be- tween dynamic and stationary catalyst temp. ex- tended range -304.0 – 304.0 K 			
			 Modeled catalyst temperature @ start > 550° C 			
			 Integrated MAF catalyst temp. conditions fulfil- led n.a. 			
			 Modeled exhaust gas temperature at O2S rear <= 1,201° C 			
			Air mass flow conditions			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 MAF per cylinder 40.0 – 130.0 kg/h 			
			 MAF per cylinder extended range 35.0 – 135.0 kg/h 			
			• MAF 125.01 – 580.0 mg/rev			
			 MAF set point 125.0 – 580.0 mg/ rev 			
			MAF extended range n.a. mg/rev			
			Limited dynamics conditions agen AG.	olkswagen AG	do _{Bo} .	
			Dynamic engine Speed < 20 RPM		os not guarantee	
		iii shilless o	Dynamic lambda controller output <= 20.0%			Race Brand
		notoon	Dynamic MAF < 25.01 mg/stk			ad littly wait
		to things of commercial purposes, in part or in whole, is not bennitied.	 Integrated MAF after dynamic conditions are ful- filled > 20.0 g 			accept and liability with respect to the correctness of information in this cochains.
		s, in par	 Evap purge conditions 			ecorrec
		purpose	 Canister load <= 2.0 [-] 			tness of
		srcial	• Or			infor
		Comme	 Evap purge valve closed 			mationir
		o ale Wild H	Close the gap conditions			This of the second
		³⁴ B _{USA}	O2S rear voltage @ diagnosis start ===================================	9	KOJUBIJAH	O ingan
			 Integrated MAF to start diagnosis n.a. 	.ĐA ns	DEWRY/OVKE	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure					
		Normalised lambda con-	General conditions								
		troller value vs. modeled	O2S front ready								
		lambda value >= 1.0 [-]	lambda value	lambda value				Time after engine start n.a.			
			 MAF to activate diagnosis func- tion n.a. 								
			 Integrated MAF per cylinder >= 0.42 – 2.0 kg 	Nage	n AG. Volkswage _r	AG _{do-}					
			Vehicle speed n.a.	ed by Volkswas		GOES not Guarantes					
			Static condition			o,					
			• Engine speed 1,056 3,008 RPM								
			 MAF per cylinder 15.0 – 150.0 kg/h 								
			Vehicle speed n.a.								
			Dynamic condi- tions								
			• Dynamic engine speed < 288 RPM								
			Dynamic torque < 80.0 Nm								
			Absolute dynamic MAF < 70.0 kg/h			AG does not guarantee					
			Activation due to canister purge								
			 canister purge Canister purge no purge Or	Ma.		(31416)1/kd					
			• Or	CACTED DY COD!		Magewaylo Vya.					
			Canister purge not active	010	d E	A no-					
			• Or								
			Canister purge wait ramp open								
			• Or								
			Canister purge min purge								
			• And								
			Canister load known								
			• Or								

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
				 Canister purge n.a. And Moving mean value canister load <= 1.80 [-] 			
	O2 Sen- sor Heat- er Cir- cuit	Oxygen Sensors Heater Front Func- tional Check	O2S ceramic temp. < 730° C C agen AG. Volkswagen A	 Stir up O2S heater front (linear) finished For time >= 10.0 s 	20.0 sContinuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.
ot commercial purposes, in part or in whole, is not bey,	P0136	O2 Sensor Circuit Bank 1 Sensor 2	 Delta voltage 	• Sensor voltage <= 0.40 V or 0.50 - 1.08 V	\$ 40.0 s high respect to the correctness of information of the correctness of the correct	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
or comme	Sor Circuit Low	Oxygen Sensors Rear Short To Ground	• O2S sensor voltage < 0.15 V	• O2S heater active	• 0.5 s • Contin- uous	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.

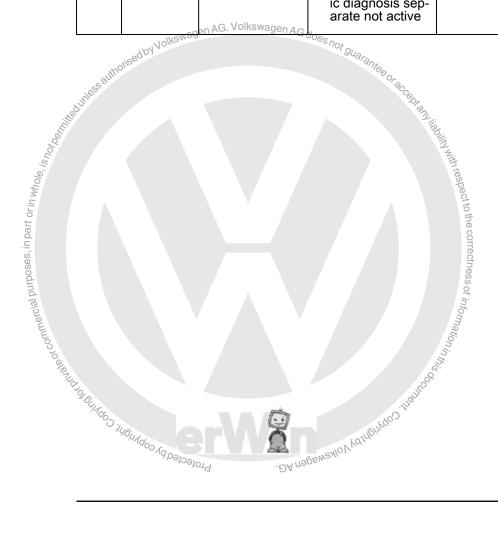
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0138 O2 Sen- sor Circuit High Volt- age Bank 1 Sen- sor 2	Oxygen Sensors Rear Short To Battery	O2S sensor voltage > 5.2 – 5.35 V	O2S heater active	• 0.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
P0139 O2 Sen- sor Circuit Slow Re- spons e Bank 1 Sen- sor 2		EWMA filtered transient time at fuel cutoff > 0.0 s In voltage range of 201 – 401 mV Number of checks >= 3 Manual of the control of the checks is a transient time at fuel cutoff > 0.0 s Manual of the control of the checks is a transient time at fuel cutoff > 0.0 s Manual of	 ble >= 547.9 mV Lean voltage <= 201.2 mV Fuel cutoff active O2S rear ready Modeled exhaust gas temp > 400° C C C D E Modeled exhaust gas temp > 400° C C D E Front O2 sensor lambda signal > 	en AG does not	gua _{ran} ,	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking". page 1149.
200	Rep. Gr.ST - G	eneric Scan Tool				



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P013 A	Oxygen Sensors	 Gradient sen- sor voltage < 	General conditions	• 86.5 s	• 2 DCY	Check the Oxygen Sen-
O2 Sen- sor	Rear Re- sponse Check	1,000.0 mV/s (arithmetic average)	• vehicle speed >= 10 km/h	Once / DCY		sor 1 After Catalytic Converter -
Slow Re- spons		,	Barometric pressure n.a.			GX7 Refer to ⇒ "3.6.25
e - Rich to			 Catalyst over- heating protec- tion not active 			Oxygen Sen- sor 1 After Catalytic
Lean			O2S rear ready			Converter GX7, Check-
1 Sen- sor 2			O2S front ready			<u>ing",</u> page 1149 .
			O2S front pump current valid			
			O2S heater rear active			
			• Integrated heat energy >= 1,600.0 – 3,000.0 kJ	s Volkswagen		
		n whole, is not be mitted	• Or Any Volkswagen At	a	AG does not ou	
			• Time after engine start > 230.0 – 1,000.0 s		o darani	ee Of accep
			• Engine speed 1,280 – 3,008 RPM		AG does not guaran.	O'ANA JABO JIJI
			 Lambda control value < 50.0% 			Vith respe
			 Lambda control- ler deviation < 0.08 – 0.15 [-] 			ect to the co
		oses, in	Quickpass trim control ready			rrectne
		or commercial purposes, in part or in the control of the control o	 Proportional part of trim control < 0.25 [-] 			ss of inform
		or comm	Lambda adaption commanded off			ationin
		of Diff House	Scavenging not active			IIIO ON
			Valve lift not active Time after a cata-		камб	ct to the correctness of information in this obounds.
			lyst purge phase >= 0.02 s	7G.	Nolkswagen,	
			Number of checks 2.0 [-]			
			Temperature conditions			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			• ECT > 60° C			
			• IAT > -48° C			
			Modeled catalyst temp. 500 – 700° C			
			Modeled catalyst temp. extended range 470 – 730° C			
			Integrated MAF catalyst temp. conditions fulfilled > n.a. g			
			Difference be- tween dynamic and stationary catalyst temp. -254.0 – 254.0 K			
		www.wage	Difference be- tween dynamic and stationary catalyst temp. ex- tended range AG -304:0-304.0 K			
		authorised by Volkswee	Modeled catalyst temperature @ start > 550° C	ot guarantee orac		
	Of the state of th	Sautrorised by Volkswage	 tended range AG -304.0 - 304.0 K Modeled catalyst temperature @ start > 550° C Modeled exhaust gas temperature at O2S rear <= 1,201° C Air mass flow conditions MAF per cylinder 40.0 - 130.0 kg/h MAF per cylinder extended range 35.0 - 135.0 kg/h MAF 125.01 - 580.0 mg/rev MAF set point 125.0 - 580.0 mg/rev MAF extended range n.a. mg/rev Limited dynamics conditions Dynamic engine speed < 20 RPM Dynamic lambda controller output <= 20.0% 		SO, SAN HEBITAL	
	hole, is n		Air mass flow conditions		Nith resp	
	rt or in w		• MAF per cylinder 40.0 – 130.0 kg/h		acttothe	
	oses, in pa		MAF per cylinder extended range 35.0 – 135.0 kg/h		correctne	
	ial purpo		• MAF 125.01 – 580.0 mg/rev		SS of inf	
	or commerc		MAF set point 125.0 – 580.0 mg/ rev		ormationin	
	Stevilo Ic		MAF extended range n.a. mg/rev		1000	
	* O(1)	(o ₀),	Limited dynamics conditions	Cobhin	8	
		orected by copyright	Dynamic engine speed < 20 RPM	10V Kd Mgin		
		-+0Д	Dynamic lambda controller output <= 20.0%			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Dynamic MAF < 25.01 mg/stk 			
			 Integrated MAF after dynamic conditions are ful- filled > 20.0 g 			
			 Evap purge conditions 			
			 Canister load <= 2.0 [-] 			
			• Or			
			 Evap purge valve closed 			
			 Close the gap conditions 			
			 O2S rear voltage @ diagnosis start >= 0.55 			
			 Integrated MAF to start diagnosis n.a. 			
		_{an} AG. Volkswagen AG.	O2S front dynamic diagnosis separate not active			



DTC / Manitan Malfanation Call Company Decrees Manifesting MIL Wholes Company	<u>D:</u> 1
DTC / De- Strategy Description old Value Secondary Parameters with Enable Conditions Conditions Conditions Conditions Conditions Conditions Conditions Component Component Component Conditions Conditions Component Component Component Component Component Component Component Conditions Conditions Conditions Conditions Component Component Conditions Cond	DI-
ton P013 Oxygen Services P102 Services P103 Oxygen Services P104 Services P105 Services P106 Services P106 Services P106 Services P106 Services P106 Services P107 Services P108 Service	Sen- er - efer Sen- er

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			• ECT > 60° C			
			• IAT > -48° C			
			 Modeled catalyst temp. 500 – 700° C 			
			 Modeled catalyst temp. extended range 470 – 730° C 			
			 Integrated MAF catalyst temp. conditions fulfil- led > n.a. g 			
			Difference be- tween dynamic and stationary catalyst temp254.0 F	agen AG does a		
		, ur peut or in whole, is not be similar to the sim	Difference be- tween dynamic and stationary catalyst temp. ex- tended range -304.0 – 304.0 K		ot gu _{arantee} or ^{ac} cep	**************************************
		le, is not _{oer,}	Modeled catalyst temperature @ start > 550° C			bility with res
		part orin who	 Modeled exhaust gas temperature at O2S rear <= 1,201° C 			and liability with respect to the correctness.
		poses, ii	Air mass flow conditions			rectness
		rcialpur	 MAF per cylinder 40.0 – 130.0 kg/h 			s of infor
		e of comme	 MAF per cylinder extended range 35.0 – 135.0 kg/h 			mation in th
		TENIHO TO S	• MAF 125.01 – 580.0 mg/rev		ai	18000
		ophrate or commercial purposes	• MAF set point 125.0 – 580.0 mg/ rev		Vahlydoo,ing	octness of information in this occur.
			MAF extended range n.a. mg/rev	. DA nagenaci	10 L.	
			Limited dynamics conditions			
			 Dynamic engine speed < 20 RPM 			
			Dynamic lambda controller output <= 20.0%			

ses, irrpart or in whole, is not be with the second of the	iless autorised b	_y Volkswagen AG. Volks	Dynamic MAF < 25.01 mg/stk Integrated MAF after dynamic conditions are fulfilled > 20.0 g Evap purge conditions Canister load <= Wag 2.0 (-1)	SOF RECEPTER		
ses, irrpair orin whole, is not poming. (eq. 1)	Ress authorised b	y Volkswagen AG. Volks	 Integrated MAF after dynamic conditions are fulfilled > 20.0 g Evap purge conditions Canister load <= Wag 2.0 [-] Or Evap purge valve closed Close the gap conditions 	Or accepted		
ses, impair or in whole, is not _{Delmit}	less authorised b	_y Volkswagen AG. Volks	 Evap purge conditions Canister load <= Wag 2.0 (-1) Or Evap purge valve closed Close the gap conditions 	³ Or ³ CC [®] Df ₈ P		
ses, irrpair orin whole, is not being. Celling	iless autorised b	yVolkswagen AG. Volks	 Canister load <= wag 2.0 [-] Or Evap purge valve closed Close the gap conditions 	SOF BOLEDIE		
ses, mpan orin whole, is not be in the second of the secon	less authorised w		Evap purge valve closed Close the gap conditions	or accept		
ses, irrpart orin whole, is not be only is			Close the gap conditions	Drag		
ses, irrparr or <i>in whole, is not_{be}</i>			Conditions	7/6		
ses, iripait orinwh			O2S rear voltage @ diagnosis start >= 0.55	SILIS WILLIAM	, ess	
, , , , , , , , , , , , , , , , , , ,			Integrated MAF to start diagnosis n.a.		pecttothec	
Ö			O2S front dynamic diagnosis separate not active		orrectness	
or commercial property of the commercial propert	Elifolo ingines	Protected by co	 @ diagnosis start >= 0.55 Integrated MAF to start diagnosis n.a. O2S front dynamic diagnosis separate not active 	do history	of informas:	

DTC / Monitor De- Strategy scrip- tion	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P013 E O2 Sensors Rear Delayed Response Monitoring, Delay Measurement Sensor 2	Sensor signal delay time > 0.9 s (arithmetic average)	 General conditions Vehicle speed >= 10 km/h Barometric pressure n.a. Catalyst overheating protection not active O2S rear ready O2S front pump current valid O2S heater rear active Integrated heat energy >= 1,600.0 - 3,000.0 kJ Or Time after engine start > 230.0 - 1,000.0 s Engine speed 1,280 - 3,008 RPM Lambda control value < 50.0% Lambda control er deviation < 0.08 - 0.15 [-] Quickpass trim control ready Proportional part of trim control ready Proportional part of trim control < 0.25 [-] Lambda adaption commanded off Scavenging not active Valve lift not active Time after a catalyst purge phase >= 0.02 s Number of checks 2.00 [-] Temperature conditions 			- Check the Oxygen Sen- Oxygen Sen- Sor 1 After Catalytic Converter, - GX7 Refer to ⇒ "3.6.25 Oxygen Sen- sor 1 After Catalytic Converter GX7, Check- ing". page 1149.	arenyliability with reser

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
			• ECT > 60° C		Oes not guarantee o	
		ESAL	1AT > -48° C		, co	, %
		ille dirices	Modeled catalyst temp. 500 – 700° C			Cepter like.
		whole, is not be	 Modeled catalyst temp. extended range 470 – 730° C 			litywith respect
		es, in part or in	 Integrated MAF catalyst temp. conditions fulfil- led > n.a. g 			(to the correct
		mmercial purpos	 Difference be- tween dynamic and stationary catalyst temp. -254.0 – 254.0 K 			ness of informati
		obyto of the second purposes, in part or in whole, is not being the second purposes, in part or in whole, is not being the second purposes.	Difference be- tween dynamic and stationary catalyst temp. ex- tended range -304.0 – 304.0 K		,,0	accept and liability with respect to the correctness of information in this occurrence of the correctness of the correctness of information in this occurrence of the correctness of the c
			• Modeled catalyst temperature @ start > 550° C	.ĐAnə	SEWENO VOTEINO	
			 Modeled exhaust gas temperature at O2S rear <= 1,201° C 			
			Air mass flow conditions			
			 MAF per cylinder 40.0 – 130.0 kg/h 			
			 MAF per cylinder extended range 35.0 – 135.0 kg/h 			
			• MAF 125.01 – 580.0 mg/rev			
			 MAF set point 125.0 – 580.0 mg/ rev 			
			 MAF extended range n.a. mg/rev 			
			Limited dynamics conditions			
			 Dynamic engine speed < 20 RPM 			
			Dynamic lambda controller output <= 20.0%			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Boosiipuoli		Dynamic MAF < 25.01 mg/stk Integrated MAF after dynamic conditions are fulfilled > 20.0 g Evap purge conditions Canister load <= 2.0 [-] Or Evap purge valve closed	Longal		
			 Close the gap conditions O2S rear voltage @ diagnosis start >= 0.55 Integrated MAF to start diagnosis n.a. O2S front dynamic diagnosis separate not active 			



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P013 F O2 Sen- sor De- layed Re- spons e - Lean to Rich Bank 1 Sen- sor 2	Oxygen Sensors Rear De-layed Re-sponse Monitoring Measure Measure ment October Measure ment october Measure ment Measure m	• Sensor signal delay time > 0.9 s (arithmetic average)	tionsVehicle speed >= 10 km/h		cod any liability with respect to the correctness of information in this occur.	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			• ECT > 60° C			
			• IAT > -48° C			
			Modeled catalyst temp. 500 – 700° C			
	authori	_{ged} by Volkswagen AG. V	 Modeled catalyst temp. extended range 470 – 730° C 	niee Or 2		
**	illi dilliess		Integrated MAF catalyst temp. conditions fulfilled > n.a. g	&CCBDF and lies		
rt orin whole, is no			Difference be- tween dynamic and stationary catalyst temp. -254.0 – 254.0 K		with respect to the	
ial purposes, in pa			ECT > 60° C IAT > -48° C Modeled catalyst temp. 500 – 700° C Modeled catalyst temp. extended range 470 – 730° C Integrated MAF catalyst temp. conditions fulfilled > n.a. g Difference between dynamic and stationary catalyst temp254.0 – 254.0 K Difference between dynamic and stationary catalyst temp254.0 – 254.0 K Difference between dynamic and stationary catalyst temp. extended range -304.0 – 304.0 K Modeled catalyst temperature @ start > 550° C Modeled exhaust gas temperature at O2S rear <= 1.201° C Air mass flow conditions where a condit a condition where a condition where a condition where a conditi		correctness of info	
COMMERCA	50		Modeled catalyst temperature @ start > 550° C		ormation in th	
	TENIHO TO FOLIS NO		Modeled exhaust gas temperature at O2S rear <= 1,201° C	180 July July 1800 Co.	5.	
	346	Mached by Copy	• Air mass flow conditions	Bingo		
		-101d	• MAF per cylinder 40.0 – 130.0 kg/h			
			MAF per cylinder extended range 35.0 – 135.0 kg/h			
			• MAF 125.01 – 580.0 mg/rev			
			• MAF set point 125.0 – 580.0 mg/ rev			
			MAF extended range n.a. mg/rev			
			Limited dynamics conditions			
			Dynamic engine speed < 20 RPM			
			Dynamic lambda controller output <= 20.0%			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	85	old Value	Secondary Parameters with Enable Conditions Dynamic MAF < AG 25.01 mg/stk of the start dynamic conditions are fulfilled > 20.0 g Evap purge conditions Canister load <= 2.0 [-] Or Evap purge valve closed Close the gap conditions O2S rear voltage @ diagnosis start >= 0.55 Integrated MAF to start diagnosis n.a. O2S front dynamic diagnosis separate not active	ot guarantee or ac	ło.	
	000/11/16/04/11		Evap purge con- ditions		O'RANA IRABILITA	
	hole, is nor		Canister load <= 2.0 [-]Or		ywith respe	
	part or in w		Evap purge valve closed		ct to the co	
	oses, in		Close the gap conditions		orrectnes	
	ercial puri		@ diagnosis start >= 0.55		S of inforn	
	Are or comm		 Integrated MAF to start diagnosis n.a. 		nation in this	
	Sand to total	£66-	 O2S front dynamic diagnosis separate not active 	(306)	SURGO	
P0140 O2 Sen- sor Circuit No Activi- ty De- tected Bank 1 Sen- sor 2	Oxygen Sensors Rear Open Circuit	• Internal resistance of O2S (binary) > 100 Ω		• 2.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P0141 O2 Sen- sor Heat- er Cir- cuit Bank 1 Sen- sor 2	Oxygen Sensors Heater Rear Out Of Range High	• Internal resistance of O2S (binary) 700.0 – 65,534.0 Ω	 Stir up O2S heater front (binary) finished For time >= 10.0 s 	• 20.0 s • Once / DCY	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
Fuel	Injection Valves Sup- ply Voltage	Boost voltage < 30.0 V	• Engine running >= 0.3 s	• 3.6 s	• 2 DCY	- Check the Fuel Injec- tors . Refer to

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Out Of Range Low	• Boost voltage <= 50.0 V		Contin- uous		⇒ "3.6.14 Fuel Injec- tors , Check-
	Injection Valves Sup- ply Voltage Out Of Range High	• Boost voltage > 75.0 V				ing", page 1127
Incor-	Incorrect Fuel Com- position	Fuel quantity incorrect	• Engine speed > 1,200 RPM	• 0.52 – 2.08 s	• 2 DCY	 Check for contamina-ted/aged fuel
Fuel Com- posi-	position	Fuel correction factor in- correct				or possible high concen- tration of al-
tion		Internal check failed				cohol in fuel (above 15%). Poor quality fuel will also in- crease con- sumption.
			ou a still a distribution of the state of th	_{ksw} agen AG. Vo	llkswagen AG does	to appropri- to appropri- ate repair manual. Check the Oxygen Sen- sor 1 Before Catalytic Converter -
		rposes, in part or in whole	To so to specification in the inventor of the			Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 . - Replace the Engine Control Module - J623 Refer to appropriate repair manual.
		u d Parcial pul	Tho to also the			Replace the Engine Control Module - J623 Refer to appropriate repair manual.
			to sound in our states of the	Protected	. ĐA nagaw	SMOV WAINBINGO : Maring

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- letters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0171 Sys- tem Too	Fuel Sys-	Lambda controller output > 35.0%	Lambda control closed loopBarometric pres-	• Contin-	• 2 DCY	Check vac- uum lines visually for
Lean	Lean		sure n.a. • Mass air flow >		e diliti	leaks. - Check the intake system
whole, is,			60.00 mg/stkEngine speed > 576 RPM		Vith respect	visually for leaks (false air).
n part or in			• ECT @ cylinder block > 55° C		ttothecor	Check the fuel pressure and delivery
urposes, ir			 IAT at intake manifold > -48° C AAT > -48° C 		rectness	quantity. Re- fer to fuel system me-
numercial pu	And lease or commercial bulk	So o o o o o o o o o o o o o o o o o o	sure n.a. • Mass air flow > 60.00 mg/stk • Engine speed > 576 RPM • ECT @ cylinder block > 55° C • IAT at intake manifold > -48° C • AAT > -48° C	160 July Indo	of information in this	chanical testing in ⇒ "3.1 Pre- liminary Check", page 13 and/ or to appro- priate repair manual.
) _{žų}	Protected by Copyrig	. ĐA nagawaylo Vyo	MENCO		- Check the Fuel Pres- sure Sensor - G247 Re- fer to ⇒ "3.6.16 Fuel Pres- sure Sensor G247, Checking", page 1131.
						- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.
						- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	ormercial purposes, in part or in whole, is not be	kedunies sauthorized by Volk	Conditions Swagen AG. Volkswagen AG Phoetog	does not guaran	ee of accept any liability with rest	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152. - Check the Fuel Delivery Unit - GX1-/ Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1/ Fuel Pump Control Module J538. Testing", page 1125.
	O to aferr	ALERO SURDO HOUNDOON APPE	BY neede	DENISHION AGING	J. Mod Signal J. Market	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	W. William	MIL Illumina- tion	Component Di- agnostic Proce- dure
P0172 System Too Rich Bank 1	Fuel System Too Rich	• Lambda controller output < -35.0%	 Lambda control closed loop Barometric pressure n.a. Mass air flow > 60.00 mg/stk Engine speed > 576 RPM ECT @ cylinder block > 55° C IAT at intake manifold > -48° C AAT > -48° C Oil dilution not detected Counter > 100.0 [-] Counter behavior: Counter increment @ cold start 0.0 - 24.0 [-] Or Counter increment @ high load 1 [-] with: Engine load > 50.0% Engine speed > 1,792 RPM For time 1.0 - 12.0 s Counter decrement by time each 5.3 - 600.0 s with: Modeled oil temperature >= 50° C 	• 60.0 s • Continuous	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. - Check the Fuel Pressure Sensor G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247. Checking" page 1131 . Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors . Checking" page 1127 . - Check the Oxygen Sensor 1 Before Catalytic Converter GX10 . Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10 . Checking". page 1152 . - Check the Fuel Delivery Unit - GX1 - / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
con-	Fuel System Pressure Sensor High Pressure Side Short To Battery / Open Circuit	• High fuel pressure sensor voltage > 4.80 V	SA negenestion variability of an agent of an agent of an agent of an agent of a second of	• 2.0 s • Contin uous Contin uous	• 2 DCY	ule J538 , Testing", page 1125 . Check the Intake Manifold Sensor - GX9- Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 . Check the EVAP Canister Purge Regulator Valve 1 - N80- Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 . Check the Fuel Pressure Sensor G247- Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247- Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 . Checking", page 1131 . Check the Fuel Pressure Regulating Valve - N276- Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve - N276- Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0191 Fuel Rail Pressure Sensor Circuit Rang e/Performanc e Bank	Fuel Rail High Pres- sure Side Out Of Range High	• Fuel pressure > 27,900.09 kPa	 Engine running Engine speed < 8,160 RPM Time after engine start > 5.0 s 	• 5.0 s • Continuous	• 2 DCY	- Check the Fuel Pressure Sensor- G247- Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131 Check the Fuel Pressure Sensor
1	"lu _{lodfo} us,	aduntes authorised by Volks	_W agen AG. Volkswagen AG	does not guarani	e of acceptany liability with	sure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
Fuel Rail Pres- sure Sen-	tem Pres- sure Sensor High Pres- sure Side Short To	 High fuel pressure sensor voltage < 0.20 V 		• 2.0 s • Continuous	• 2 DCY	Check the Fuel Pressure Sensor-G247- Refer to 3.6.16 Fuel Pressure Sensor G247 Checking", page 1131.
	moo ro ayan	TABINDO TABINDO NA PE	SM DAnsect	ідиру Vоікемад	Add Carrier of the Control of the Co	- Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 . Checking", page 1129 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cylin- \der 1	Injection Valves Electrical Error	 Indeterminate fault pattern via power stage diagnosis detected And Injector low side voltage < 2.0 V Injector low side switch current > 25.0 A Or Injector low side voltage < 2.0 V Injector low side voltage < 2.0 V Injector low side voltage < 2.0 V Injector low side switch current (hardware values) > 9.0 - 14.0 A Or Injector low side switch current > 25.0 A Injector low side switch current (hardware values) > 9.0 - 14.0 A Injector load resistance to ground and battery > 20.0 Ω Injector low side switch current > 25.0 A Injector low side switch current > 25.0 A 	• Engine running • ECT @ cylinder block >= -30° C • Engine speed < 7,000 RPM • Injection time n.a. Injection time n.a. EADY VOIKSWAGEN AG. VOIKS BEADY VOIKSWAGEN AG. VOIKS	• 8,640.0° CRK • Continuous wagen AG does	not guarantee or acce	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Open Cir- cuit	 Or Injector load resistance to ground and battery 20.0 Ω Injector high side switch current > 25.0 A Or Power stage temperature > 150° C Fault pattern for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V 	Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM 100		JA JOKawagen A.C.	addilly with response to the state of the st
	Injection Valves Short Cir- cuit	 Fault pattern for short cir- cuit via power stage diagno- sis detected Injector cur- rent rise time during peak phase < 0.064 ms 				

Nolkswagen AG. Volkswagen AG does no

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0202 Cylinder 2 Injector "A" Circuit	Injection Valves Electrical Error	 Indeterminate fault pattern via power stage diagnosis detected And Injector low side voltage < 2.0 V Injector low side switch current > 25.0 A Or Injector low side voltage < 2.0 V Injector low side voltage < 2.0 V 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 			- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.
		Injector low side voltage < 2.0 V				
		Injector low side switch current (hard- ware values) > 9.0 – 14.0 A	authorised by Volkswage	n AG. Volkswa	gen AG does not 9u	arantee or a
		• Or	Juniess			4CCBDFB
		 Injector voltage < 2.0 V Injector low side switch current ≥ 25.0 A 	Buness authorised by Volkswage			W lightiff with respect
		Injector volt- age < 2.0 V				
		Injector low side switch current (hard- ware values) > 9.0 – 14.0 A				os of Info
		Injector load resistance to ground and battery > 20.0 Ω				That ion in this od but
		Injector low side switch current > 25.0 A	*Bulldon juguadon Agponom	rW.	S GRWSHION R	AMBINGO THE

.DA na

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Upection whole, is not not in whole, is not been have a same contract of the same same in the same same same same same same same sam	Fault pattern for open cir-	Engine stop not active		o Contraction in this contraction in this contraction in this contraction in this contraction in the contrac	ect to the correctness of info
	Open Cir	cuit via power stage diagnosis detected Injector low side voltage < 2.0 Volume	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time h.a. 	Λομβ	KOO, Halling of	
	Injection Valves Short Cir- cuit		DA No	Olkewa9		
		Injector cur- rent rise time during peak phase < 0.064 ms				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0203 Cylinder 3 Injector "A" Circuit	Electrical Error	 Indeterminate fault pattern via power stage diagno- sis detected And 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM 	8,640.0° CRK Continuous	• 2 DCY	 Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking",
		• Injector low side voltage < 2.0 V	Injection time n.a.			page 1127 .
		Injector low side switch current > 25.0 A				
		• Or				
		• Injector low side voltage < 2.0 V				
		Injector high side switch current > 25.0 A				
		• Or				
		• Injector low side voltage < 2.0 V				
10.55 AU	Moliseaph Volkems	on Injector lown AC side switch current (hard- ware values) > 9.0 – 14.0 A	adoes not guarantee or accept and			
*Sqriu		• Or	Drigh			
notbornii		• Injector volt- age < 2.0 V		iability wi		
100, 18		• Injector low side switch current > 25.0 A		h respect to th		
		• Injector volt- age < 2.0 V		e correc		
		Injector low side switch current (hard- ware values) > 9.0 – 14.0 A		tness of informa		
To hold was en con		• Injector load resistance to ground and battery > 20.0 Ω	agewes/10 V Verification in the interpretation of the interpretati	tioninthis		
Sindo	Schod by Copyright	• Injector low side switch current > 25.0	9 DEWRANO VOTABITY OF JAN 2018			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Open Circuit Injection Valves Short Circuit	 Or Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current > 25.0 A Or Power stage temperature > 150° C Fault pattern for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V Fault pattern for short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms 	Secondary Parameters with Enable Conditions • Engine stop not active • ECT @ cylinder block >= -30° C • Engine speed < 7,000 RPM • Injection time n.a.	AG does not gu	A The of acteur and the state of the state o	with respect to the correctness of $inform_{alion_{in}}$
			.e. Protected b	A nageneylo V Kr		

SC	FC / De- crip- on	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Injection Valves Electrical Error Sessaumorised by Vo. Sessaumorised by	 Indeterminate fault pattern via powerlkswage diagnosis detected And Injector low side voltage < 2.0 V Injector low side switch current > 25.0 A Or Injector low side voltage < 2.0 V Injector low side voltage < 2.0 V Injector low side switch current (hardware values) > 9.0 - 14.0 A Or Injector low side switch current > 25.0 A Or Injector low side switch current (hardware values) > 9.0 - 14.0 A Injector low side switch current (hardware values) > 9.0 - 14.0 A Injector low side switch current (hardware values) > 9.0 - 14.0 A Injector load resistance to ground and battery > 20.0 Ω Injector low side switch current > 25.0 A Injector low side switch current > 25.0 A 	• ECT @ cylinder en A block >= -30° C • Engine speed < 7,000 RPM • Injection time n.a.	8,640.0° CRK Continuous Gat and liability with respect to the correctness of information in this coordinates. Capture of the correctness of information in this coordinates. Capture of the correctness of information in this coordinates.		- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Or Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current > 25.0 A Or Power stage temperature > 150° C 				
	Injection Valves Open Cir- cuit	Fault pattern for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V	Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a.	_{SW} agen AG. Vo	lkswagen AG does	not guarantee oraceloran
	Injection Valves Short Cir- cuit	Fault pattern for short circuit via power stage diagnosis detected Injector current rise time				- Check the Throttle Valve Con- trol Module -
Throt- tle/	Throttle Position Sensor 2 Rationality Check	during peak phase < 0.064 ms	• Throttle adaption not active	• 0.01 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169 .

			Aby Vo			942.
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0222 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "B" Circuit Low	Throttle Position Sensor 2 Short To Ground	Throttle position sensor 2 voltage < 0.25 voltage < V V Throttle position sensor 2 voltage voltage < 0.25 voltage v		• 0.1 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
P0223 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "B" Circuit High	Throttle Position Sensor 2 Short To Battery Plus	tion sensor 2 voltage > 4.83 V	• Engine running	• 0.1 s • Continuous	• 2 DCX	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34" Throttle Valve Control Module GX3, Checking", page 1169
P0234 Tur- bo- charg- er/Su- per- charg- er "A" Over- boost Con- dition	Turbo- charger Boost Pres- sure Con- trol Out Of Range High	sure > calcu- lated max. plausible val-	 Engine running Accelerator pedal value > 0.0% Fuel cut off n.a. Difference between boost pressure and barometric pressure >= 20.0 kPa 		• 2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 . - Check the Charge Air Pressure Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0236 Tur- bo- charg-	Check	Diff. turbo-charger boost pressure vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa Diff. BARO vs. MAP <= 7.50 kPa	 stop @ start of DCY Engine stopped Vehicle speed < 1 km/h 	• 3.0 s • Continuous	• 2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 Check the Charge Air Pressure Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
		RAILO TO BUILDOO 74	Protected by copyrig	-DAnagay	PENIOV VOIMBINGOO,	ss of information in this cocurrence.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0237 Tur- bo- charg- er/Su- per- charg- er Boost Sen- sor "A" Circuit Low	Turbo- charger Boost Pres- sure Sensor Short To Ground	Turbocharger boost pressure sensor voltage < 0.20 V	_{se} dby Volkswagen AG. Volks	O.5 s Continuous wagen AG does	• 2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 Check the Charge Air Pressure Actuator - 1465 Refer to ⇒ 3.6.7 Charge Air Pressure Actuator V465, Checking", page \$113.
P0238 Turbocharg- er/Super- charg- er Boost Sensor "A" Circuit High	Charger Boost Pres-	Turbocharger boost pressure sensor voltage > 4.80 V		Continuous	• 2 DCY	Charge Air Pressure Sensor - G31- Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P025 A Fuel Pump Mod- ule "A" Con- trol Cir- cuit/ Open	Fuel Pump Open Cir- cuit	 Signal voltage lower range > 1.92 - 2.21 V And Signal voltage upper range (hardware values) < 2.84 - 3.25 V 	PWM 9.80 – 90.20% • Fuel pump commanded off	0.5 s Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", /age page 1125 .	
P025 C Fuel Pump Mod- ule "A" Con- trol Circuit Low	Fuel Pump Short To Ground	• Signal voltage < 1.92 – 2.21 V (hardware values)	Commanded PWM 9.80 – 90.20% Fuel pump commanded off manded off m	• 0.5 s	• 2 DCY	- Check the Suaper Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .	arice of acceptany liability with respect to the corr
P025 D Fuel Pump Mod- ule "A" Con- trol Circuit High	Fuel Pump Short To Battery Plus	 Power stage temperature > 160.0 - 200.0° C Or Signal current (hardware values) > 0.1 - 0.18 A 	Commanded PWM 9.80 – 90.20% Fuel pump commanded on Engine running	• 0.5 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 €	e of aced and liability with respect to the correctness of information in this occupant.
	Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis de- tected Injector volt- age < 2.0 V 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	CRK Continuous	P⊋⊊2;DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 .	

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Injection Valves Short To Ground (High Side)	 Injector driver voltage < 2.0 V And Injector driver high side switch current > 25 A (hardware Values) Injector driver 	AG does not	 720° CRK Continuous 720° 		
urposes, in part or in whole, is note.	P0262 Cylinder 1 Injector "A"	Valves Short To Ground (Low Side)	 Injector driver voltage < 2.0 V And Injector driver high side switch current < 25 A And Injector driver low side switch current < 25 A (hardware values) 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM 	CRK Continuous Mithrespect to the correctness		
nroommerdialp	P0262 Cylin- der 1 Injec- tor "A" Circuit High	Short To Battery Plus	 Fault pattern for short to battery plus via power stage diagnosis detected Injector voltage > 2.0 V Injector driver voltage > 2.0 V And Injector driver high side switch current 	• ECT @ cylinder block >= -30° C • Engine speed < 7,000 RPM	 8,640.0° CRK Continuous 720° CRK Continuous 	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
		Injection Valves Short To Battery Plus (Low Side)	> 25 A (hard- ware values) • Injector driver voltage > 2.0 V	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM 	 720° CRK Continuous 		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cylin-	Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis detected Injector voltage < 2.0 V 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	8,640.0° CRKContinuous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
	Injection Valves Short To Ground (High Side)	 Injector driver voltage < 2.0 V And Injector driver high side switch current > 25 A (hard-ware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. rolkswagen AG does not guan 	 720° CRK Continuous 		
purposes, in part or in whole, is no	Injection Work Valves Short To Ground (Low Side)	 Injector driver voltage < 2.0 V And Injector driver high side switch current < 25 A And Injector driver low side switch current < 25 A (hardware values) 		• 720° CRK • Contin- uous	apility with respect to the correctness of in	
Cylin =	Injection Valves Short To Battery Plus Injection Valves Short To Battery Plus (High Side)	 Fault pattern for short to battery plus via power stage diagnosis detected Injector voltage > 2.0 V And Injector driver voltage > 2.0 V 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	8,640.0° CRK Continuous 720° CRK Continuous	• DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Short To Battery Plus (Low Side)	 Injector driver voltage > 2.0 V And Injector driver low side switch current > 25 A (hardware values) 	 Engine running AG. Volkswag Colling Colli	• 720° • CRK • Contin- uous	Quarantee or accept and in	W Killing William Killing Will
P0267 Cylinder 3 Injector "A" Circuit Low	Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis detected Injector voltage < 2.0 V 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	8,640.0° CRKContinuous		- Check the Fuel Injectors. Refer to ⇒ 3.6.14 Fuel Injectors, Checking, page 1127.
	Injection Valves Short To Ground (High Side)	 Injector driver voltage < 2.0 V And Injector driver high side switch current > 25 A (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	• 720° CRK • Continuous	Kankingoo jilaunoo	information in this
	Injection Valves Short To Ground (Low Side)	 Injector driver voltage < 2.0 V And Injector driver high side switch current < 25 A And Injector driver low side switch current < 25 A (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	• 720 € MOT © CRK • Continuous	les.	
P0268 Cylinder 3 Injector "A" Circuit High	Injection Valves Short To Battery Plus	 Fault pattern for short to battery plus via power stage diagnosis detected Injector voltage > 2.0 V 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	8,640.0° CRK Continuous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Short To Battery Plus (High Side)	 Injector driver voltage > 2.0 V And Injector driver high side switch current 25 A (hardware values) 	 Engine running AG. Volkswag Cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	• 720° en A CRK • Contin- uous	Quaraniee or acceptan	in billidail
	Injection Valves Short To Battery Plus (Low Side)	 Injector driver voltage > 2.0 V And Injector driver low side switch current > 25 A (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	 720° CRK Continuous 		nability with respect to the correctness of info
P0270 Cylinder 4 Injector "A" Circuit Low	Injection Valves Short To Ground	Fault pattern for short to ground via power stage diagnosis detected Injector voltage < 2.0 V	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a 	8,640.0° CRK Continuous		- Check the Fuel Injec- tors . Refer to ⇒ "3.6.14 Fuel Injec- tors , Check- ing", page 1127 .
	Injection Valves Short To Ground (High Side)	 Injector driver voltage < 2.0 V And Injector driver high side switch current > 25 A (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	720% [™] CRK Continuous		
	Injection Valves Short To Ground (Low Side)	 Injector driver voltage < 2.0 V And Injector driver high side switch current < 25 A And Injector driver low side switch current < 25 A (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	• 720° CRK • Contin- uous		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0271 Cylin- der 4 Injec- tor "A" Circuit High	Injection Valves Short To Battery Plus	 Fault pattern for short to battery plus via power stage diagno- sis detected Injector volt- age > 2.0 V 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	8,640.0° CRK AG. Volkswag Continuous	• 2 DCY en AG does not gu	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking" page 1127 .
	Injection Valves Short To Battery Plus (High Side)	 Injector driver voltage > 2.0 V And Injector driver high side switch current > 25 A (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	• 720° CRK • Continuous		Spility With Look
	Injection Valves Short To Battery Plus (Low Side)	 Injector driver voltage > 2.0 V And Injector driver low side switch current > 25 A (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time n.a. 	• 720° CRK • Continuous		Check the
Tur- bo- charg-	Turbo- charger Boost Pres- sure Con- trol Out Of Range Low	 Boost pressure < calculated min. plausible value And Boost pressure deviation > 5.0 kPa 	Engine running	• 4.0 s Continuous	S DCX Volvey	Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 . Check the Charge Air Pressure Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Leak to In- take Mani-	Turbo charger actuator set	Engine running	• 0.01 s		
	fold Adap-	point >= 18.0	Conditions:	Continuous		
	tive Value Check	_ 21.0%	• For time >= 0.5 s	uous		
		wagen AG	Difference be- tween filtered boost pressure and basic boost pressure > 40.01 Volk Wagen AG door			
	ilieduries sairt	orised by Volkswagen AG	and basic boost pressure > 40.01 Not be a pressure > 40.01 Difference be of tween filtered boost pressure set point and basic boost pressure control deviation < 20.0 kPa boost pressure set point < 16.0 kPa Actual boost pressure control deviation < 20.0 kPa boost pressure set point < 16.0 kPa Actual boost pressure < 30.0 kPa Difference between current boost pressure set point and basic boost pressure set point and basic boost pressure > 3.0 kPa ECT > -20° C IAT @ throttle > 0° C Engine speed 2,500 - 6,800 RPM Condition:	arantee or acceptal		
Whole .	, s notborn,		Boost pressure control deviation < 20.0 kPa boost pressure set point < 16.0 kPa		ability with respect	
inpart or in			 Actual boost pressure < 30.0 kPa 		to the corre	
mercial purposes.			 Difference be- tween current boost pressure set point and ba- sic boost pres- sure > 3.0 kPa 		octness of informati	
	100,100		• ECT > -20° C		onin	
	Stort Private		 IAT @ throttle > 0° C 	aurc	16. 2	
	Windo?	Protected by copyrigh	• Engine speed 2,500 – 6,800 RPM	The Copyright		
		Profector	• For time >= 5,000 ms			
			Difference be- tween actual tur- bocharger speed and maximum turbocharger speed set point > 9,003 RPM			
			Conditions:			
			• For time >= 1,000 ms			
			No gear shift			
			 Fuel cut off not active 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Misfire Crankshaft Speed Fluc- tuation	Number of cylinders with emission threshold mis- fire within 4,000 revolu-	Emission thresh- old misfire detec- ted	• 0.0 s • Continuous	• 2 DCY	Check the spark plugs visually for signs of fouling.
der Mis- fire De- tected		tions >= 2.0 [-]OrNumber of cylinders with				Check the intake system visually for leaks (false air).
		emission threshold mis- fire within 1,000 revolu- tions >= 2.0 [-]	orised by Volkswagen AG. Vo	lkswagen AG d	pes not gualantee or	Carbon buildup may cause a high- er than nor- mal com- pression reading and may contrib- ute to this concern Re- fer to appro- priate repair manual for low com- pression readings or for carbon buildup re- moval:
		No. O.	Protected by copyright;	-ĐA neg	EWRANO V VOLIMENTARY	Check". page 13 and/ or to appro- priate repair manual.
						 Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 Check the Ig-
						nition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Number of cylinders with catalyst dam- aging misfire >= 2.0 [-]	Catalyst damaging misfire detected		Immediately	with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking", page 1133 .
Sandramiles	Nessauthorised by V	_{Olk} swagen AG. Volkswa	Gen AG does not guarantes of	cedtam liability with respect to the		
of commorpial Port	OHADO HONADOS	Protected	. DA nagewaylo V kdhibiy qoz	The soli information in this Route of the solid		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0301 Cylinder 1 Misfire Detected	Misfire Crankshaft Speed Fluc- tuation	 Catalyst damage misfire within 200 rev For A/T: Catalyst damaging misfire rate > 5.56 – 62.50% 	 Initial engine speed > 550 RPM Engine speed > 550 RPM Engine speed < 6,848 RPM Time after engine 	200 revContinuous	Immediately	 Check the spark plugs visually for signs of fouling. Check the intake system visually for
		For DC/T:Catalyst damaging misfire	start n.a. • And			leaks (false air).
		rate > 5.56 – 62.50%	 Depending on transmission mode for M/T: Engine load > 7.2 			engine me- chanical fault with a cylin- der compres-
		Catalyst dam-	– 44.5% IkswÆon A∕T:			sion test. Carbon buildup may cause a high-
	Jess authorise	For M/T: Catalyst dam-	 Engine load > 8.0 - 43.0% And 	lee or accept and lie		er than nor- mal com- pression reading and
J _t O ₂	ill diff.	aging misfire rate > 5.56 – 62.50%	block @ start	St dry lide like		may contrib- ute to this concern. Re- fer to appro-
ses, in part orin whole, is n		 Emission threshold mis- fire within 1,000 rev for A/T: Emission threshold mis- fire rate (MR) 	 ECT @ cylinder block @ engine start <= -48° C Then activation if ECT @ cylinder block >= 20° C Or 	• 1,000 rev • Continuous	2 DCY	priate repair manual for low com- pression readings or for carbon buildup re- moval.
or commercial purpl	Stand to do	aging misfire rate > 5.56 - 62.50% • For M/T: • Catalyst damaging misfire rate > 5.56 - 62.50% • Emission threshold misfire within 1,000 rev for A/T: • Emission threshold misfire rate (MR) > 2.25% • For DC/T: • Emission threshold misfire rate (MR) > 2.25% • For CV/T: • Emission threshold misfire rate (MR) > 2.25% • For MT: • Emission threshold misfire rate (MR) > 2.25% • For MT: • Emission threshold misfire rate (MR) > 2.25% • For MT:	 ECT @ cylinder block @ engine start > -48° C And Fuel cut off not active Or 	J.MdoO j.Hallhoods	ss of information is	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary
	146 ₀ 146 <u>1</u>	• Emission threshold mis- fire rate (MR) ⇒ 2.25% • For MT:	Number of fade	_{II} NdOO **		Check", page 13 and/ or to appro- priate repair manual.
		Emission threshold mis- fire rate (MR) > 2.25%	 out cylinders 2.0 [-] And Dynamic manifold air pressure <= n.a. kPa 			- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
			 Dynamic throttle position <= n.a.° TPS/sec. 			Check the Ignition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Emission threshold misfire within 4,000 rev for A/T: Emission threshold misfire rate (MR) > 2.40% For DC/T: Emission threshold misfire rate (MR) > 2.40% For CV/T: Emission threshold misfire rate (MR) > 2.40% For M/T: Emission threshold misfire rate (MR) > 2.40% 	 And Engine n.a. Engine speed < n.a. RPM Dynamic of ignition angle <= n.a. ° CRK Or Dynamic of ignition angle <= n.a. ° CRK And Rough road not detected 	4 x 1,000 rev Continuous G. Volkswagen	AG does not gu _{ara}	with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking". page 1133 .
	Misfire Crankshaft Speed Fluc- tuation	 2.40% Catalyst damage misfire within 200 rev for A/T: Catalyst damaging misfire rate ≥ 5.56 – 62.50% For DC/T: Catalyst damaging misfire rate > 5.56 – 62.50% For M/T: Catalyst damaging misfire rate > 5.56 – 62.50% For M/T: Catalyst damaging misfire rate > 5.56 – 62.50% For M/T: Catalyst damaging misfire rate > 5.56 – 62.50% 	Initial engine speed > 550 RPM Engine speed > 550 RPM Engine speed < 6,848 RPM Time after engine start n.a. And Depending on transmission mode for M/T: Engine load > 7.2 - 44.5% For A/T: Engine load > 8.0 - 43.0% And Depending on ECT @ cylinder block @ start ECT @ cylinder block @ engine start <= -48° C Then activation if	Continuous		 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Doscription	 Emission threshold misfire within 1,000 rev for A/T: Emission threshold misfire rate (MR) > 2.25% For DC/T: Emission threshold misfire rate (MR) > 2.25% For CV/T: Emission threshold misfire rate (MR) > 2.25% For MT: Emission threshold misfire rate (MR) > 2.25% Emission threshold misfire rate (MR) > 2.40% For DC/T: Emission threshold misfire rate (MR) > 2.40% For CV/T: Emission threshold misfire rate (MR) > 2.40% For CV/T: Emission threshold misfire rate (MR) > 2.40% For M/T: Emission threshold misfire rate (MR) > 2.40% 	 ECT @ cylinder block >= 20° C Or ECT @ cylinder block @ engine start > -48° C And Fuel cut off not a active Now active Or Number of fade out cylinders < 2.0 [-] And Dynamic manifold air pressure <= n.a. kPa Dynamic throttle position <= n.a.° TPS/s And Engine n.a. Engine speed < n.a. RPM 	 1,000 rev Continuous Quality of the continuous 4 x 1,000 rev Continuous 		buildup re- moval. - Check the fuel pressure and delivery quantity. Re-
		> 2.40%				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
De- scrip- tion	Strategy Description	 teria and Threshold Value Catalyst damage misfire within 200 rev for A/T: Catalyst damaging misfire rate > 5.56 – 62.50% For DC/T: Catalyst damaging misfire rate > 5.56 – 62.50% For CV/T: Catalyst damaging misfire rate > 5.56 – 62.50% For M/T: Catalyst damaging misfire rate > 5.56 – 62.50% For M/T: Catalyst damaging misfire rate > 5.56 – 62.50% Emission threshold misfire within 1,000 rev for A/T: Emission threshold misfire within 1,000 rev for A/T: 	 ters with Enable Conditions Initial engine speed > 550 RPM Engine speed > 550 RPM Engine speed < 6,848 RPM Time after engine start n.a. And Depending on transmission mode for M/T: Engine load > 7.2 - 44.5% For A/T: Engine load > 8.0 - 43.0% And Depending on ECT @ cylinder block @ start ECT @ cylinder block @ engine start = -48° C Then activation if ECT @ cylinder block >= 20° C Or 	Time Length • 200 rev • Continuous an AG. Volkswa • 1,000 rev	• Immediately	agnostic Proce-
		 For DC/T: Emission threshold misfire rate (MR) > 2.25% For CV/T: Emission threshold misfire rate (MR) > 2.25% For MT: Emission threshold misfire rate (MR) > 2.25% 	 Fuel cut off not active Or Single fuel cut off not active Or 		. DA negsweato Vy	fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. - Check the Fuel Injectors, Refer to ⇒ "3.6.14" Fuel Injectors, Checking", page 1127. - Check the Ignition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Emission threshold misfire within 4,000 rev for A/T: Emission threshold misfire rate (MR) > 2.40% For DC/T: Emission threshold misfire rate (MR) > 2.40% For CV/T: Emission threshold misfire rate (MR) > 2.40% For M/T: Emission threshold misfire rate (MR) > 2.40% For M/T: 	 And Engine n.a. Engine speed < n.a. RPM Dynamic of ignition angle <= n.a. ° CRK Or Dynamic of ignition angle <= n.a. ° CRK And Rough road not detected 	 4 x 1,000 rev Continuous 		with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking", page 1133 .
der 4	Misfire Crankshaft Speed Fluc- tuation	 Catalyst damage misfire within 200 rev for A/T: Catalyst damaging misfire rate > 5.56 – 62.50% For DC/T Catalyst damaging misfire rate > 5.56 – 62.50% For GV/T: Catalyst damaging misfire rate > 5.56 – 62.50% For M/T: Catalyst damaging misfire rate > 5.56 – 62.50% For M/T: Catalyst damaging misfire rate > 5.56 – 62.50% 	 Initial engine speed > 550 RPM Engine speed > 550 RPM Engine speed < 6,848 RPM Time after engine start n.a. And Depending on transmission mode for M/T: Engine load > 7.2 - 44.5% For A/T: Engine load > 8.0 - 43.0% And Depending on ECT @ cylinder block @ start ECT @ cylinder block @ engine start <= -48° C Then activation if 		• Immediately AG does not guara	- Check the intake system visually for leaks (false air). - Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low com-

			unles			
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Emission threshold misfire within 1,000 rev for A/T: Emission threshold misfire rate (MR) > 2.25% For DC/T: Emission threshold misfire rate (MR) > 2.25% For CV/T: Emission threshold misfire rate (MR) > 2.25% For MT: Emission threshold misfire rate (MR) > 2.25% For MT: Emission threshold misfire rate (MR) > 2.40% For DC/T: Emission threshold misfire rate (MR) > 2.40% For CV/T: Emission threshold misfire rate (MR) > 2.40% For CV/T: Emission threshold misfire rate (MR) > 2.40% For M/T: Emission threshold misfire rate (MR) > 2.40% For M/T: Emission threshold misfire rate (MR) > 2.40% 	 ECT @ cylinder block >= 20° C Or ECT @ cylinder block @ engine start > -48° C And Fuel cut off not active Or Number of fade out cylinders < 2.0 [-] And Dynamic manifold air pressure <= n.a. kPa Dynamic throttle position <= n.a. TPS/s And Engine speed < n.a. RPM Dynamic of ignition angle <= n.a. ° CRK Or Dynamic of ignition angle <= n.a. ° CRK And Rough road not detected 	• 1,000 rev • Continuous • 4 x 1,000 rv • Continuous	• 2 DCY	buildup removal. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Fuel Injectors, Checking", page 1127. Check the Ignition Coils with Power Output Stage. Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage, Checking", page 1133.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0321 Ignition/ Distributor Engine Speed Input Circuit Rang		 Comparison of counted teeth vs reference = incorrect Monitoring reference gap failure 		• 1.5 s	• 2 DCY	- Check the Engine Speed Sen- sor - G28 Refer to ⇒ "3.6.11 Engine Speed Sen- sor G28, Checking", page 1121.
e/Per- for- manc e		nless autroise	aby Volkswagen AG. Volksw	agen AG does n	ot gu _{arante} e of accept	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107
P0322 Ignition/ Distributor Engine Speed Input Circuit	2	 Camshaft sig- 		• 2.5 s	• 2 DCY	Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.
Signal		Signal fault counter (com-			VOO JASIN	- Check the Camshaft Position Sensor - G40 Refer to \$\frac{3.6.4}{Camshaft}\$\frac{Position}{Sensor G40}\$\frac{Checking", page 1107}\$\frac{100}{200}\$\frac{1000}{200}\$\frac{100}{200}\$\frac{100}{200}\$\frac{1000}{200}\$\frac{100}{200}\$\frac{100}{200}\$\frac
	Knock Control System Error	 Signal fault counter (combustion) > 24 Signal fault counter (measuring window) > 2.0 [-] 	ே,Engine speed 2,500,RPM	s 2.0	o Nº2 DCY	- Check the Knock Sensor 1 - G61 Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Solution in part or in when	Difference between knock sensor signal and average knock sensor signal < 0.0 – 0.12 V	 ECT @ cylinder block > 60° C MAF > 229.0 mg/ stk 	4.3 sContinuous	• 2 DCY	Check the Knock Sensor 1 - G61 - Refer to ⇒ 3.6.21 Knock Sensor 1 G61 - Checking", page 1141 .
	Knock Sensor Out Of Range	• Sensor signal < 0.27 – 0.31 V	ECT @ cylinder block > 60° C MAF > 229.0 mg/ stk oud Engine speed > 2,016 RPM	ontin- ONKEMEGGEN VG.	• 2 DCY	- Check the Knock Sensor 1 - G61 - Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.
Knock	Knock/ Combus- tion Vibra- tion Sensor 1 Circuit High Bank 1 or Single Sensor	 Upper threshold > 1.0 V Or for signal range check > 15 – 115.87 V 	 Engine speed > 1,000 RPM Or for signal range check ECT > 40.5° C Engine load > 35 - 60% Engine speed > 2,000 RPM 	• 0.5 s	• 2 DCY	- Check the Knock Sensor 1 - G61 Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.

Dī	ΓC /	Monitor	Malfunction Cri-	Secondary Parame-	Monitoring	MIL Illumina-	Component Di-
SC	e- rip- on	Strategy Description	teria and Thresh- old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure
Creaming and oring whole of the company of the comp	ank naft osi- on en- or A" cuit	Crankshaft Position Sensor Ac- tivity Check	 Case 1: Counted exhaust camshaft signals without synchronization >= n.a. [-] Or Counted intake camshaft signals without synchronization >= n.a. [-] Case 2: Counted exhaust camshaft signals without synchronization n.a. Or Counted intake camshaft signals without synchronization n.a. Or Counted intake camshaft signals without synchronization >= 17.0 [-] 	>= 1.0 s • Or	• Continuous with respect to a second of the	the collectness.	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121 Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107.
		Crankshaft Position Sensor Out Of Range	 Pulse width backwards < 62; > 150 µs For number of pulse widths outside tolerance > 1.0 [-] Or Pulse width forwards < 15; > 62 µs For number of pulse widths outside tolerance > 1.0 [-] 	• Engine speed > 32; < 1,200 RPM	 1,800.0° CRK Continuous 		
Cri sh Po tie	ank naft	Crankshaft Position Sensor Ra- tionality Check	Crankshaft synchroniza- tion lost	Engine running	2,160.0° CRKContinuous	• 2 DCY	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions 3. Volkswagen AG of the Second Sec	Monitoring MIL Illumina- Time tion Length	Component Diagnostic Procedure
sor "A" Circuit Rang e/Per- for- manc e	Maria de la companya	One or two additional teeth recognized incorrect Or One or two teeth missed	• Engine speed 200 320 RPM	• Contin- uous	Engine Speed Sensor G28. Checking", page 1121. Check the Camshaft Position Sensor - G40 Refer
nial purposes, in part or in we	orthware or commerce and the state of commerce and the state of commerce and the state of the st	 Sensor signal < 50 – 156 μs And Engine speed > 1,200 RPM Or Sensor signal < 30 μs And Engine speed <= 1,200 RPM 		45,720.0° CRK Continuous	to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107.
	Crankshaft Position Sensor Out Of Range	• Segment adaptation >= 146, 7.0%	 Fuel cut off all cylinders active Segments in fuel cut-off mode ≥= 32.0 [-] 	• 180.0° CRK • Contin- uous	
Cam- shaft Posi- tion	Camshaft Position Sensor In- take Signal Activity Check	 Signal change not detected For number of reference gap >= 3.00 [-] 	• Engine speed > 32 RPM	• 2,520.0° • 2 DCY CRK • Contin- uous	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 Check the Engine Speed Sensor - G28 Refer to
					⇒ "3.6.11 Engine Speed Sen- sor G28, Checking", page 1121.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cam- shaft Posi- tion Sen- sor "A" Circuit Rang e/Per- for- manc	Camshaft Position Sensor In- take Ration- ality Check	 Segment period ratio factor < 0.36; > 2.75 [-] Or Offset between camshaft and crankshaft < -79.0; > 15.0° CRK 	• Engine speed > 32; < 8,160 RPM	• 952.5° CRK • Continuous	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 , Checking", page 1107 .
e Bank 1 or Single Sen- sor	Camshaft Position Sensor In- take Angu- lar Offset Check	Offset be- tween cam- shaft and crankshaft < -79.0; > 15.0° CRK	Engine speed > 32 RPM	450.0° CRK Continuous		- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sen-
	Camshaft Position Sensor In- take Signal Activity Check	• Segment time value < 50 μs	32; < 8,160 RPM	• 1,440.0° CRK • Continuous		sor G28, Checking", page 1121.
Cam- shaft Posi- tion Sen- sor "A" Circuit Low Bank 1 or Single Sen- sor		Signal voltage town Crankshaft signals = 8 [-]	en AG does not guarantes orac	O.5 s Ceptary liability with respect to the correctness of information	• 2 DCY	 Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107. Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.
o o o o o o o o o o o o o o o o o o o	Elindo Hoindoo No	Blogloelo19	BA nagewayon Vidingingoo	in the last of the		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0343 Cam- shaft Posi- tion Sen- sor "A" Circuit High Bank 1 or Single Sen- sor	Position Sensor "A" Circuit High	Signal voltage high Crankshaft signals = 8 [-]	• Engine speed >	• 0.5 s	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 . Checking". page 1107 . Check the Engine Speed Sensor G28 . Refer to ⇒ "3.6.11 Engine Speed Sensor G28 . Refer to ⇒ "3.6.11 Engine Speed Sensor G28 . Checking" page 1121
P0351 Ignition Coil "A" Primary Control Circuit/ Open	Ignition Coil "A" Primary Control Cir- cuit/Open	O.Ž5 – -2.0 mA Internal check failed failed Internal check failed	68Ŏ RPM	• Continuous		nition Coils owith Power Coutput Stage . Refer to ⇒ "3.6.17 toonition Coils With Power Output Stage Checking".
P0352 Ignition Coil "B" Primary Control Circuit/ Open	Ignition Coil "B" Primary Control Cir- cuit/Open	 Signal current 0.25 – -2.0 mA Internal check failed 	Engine speed > 680 RPM	• 2.0 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P0353 Ignition Coil "C" Primary Control Circuit/ Open	Ignition Coil "C" Primary Control Cir- cuit/Open	 Signal current 0.25 – -2.0 mA Internal check failed 	• Engine speed > 680 RPM	2.0 sContinuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage , Checking", page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Ignition Coil "D" Primary Control Cir- cuit/Open	O.25 – -2.0 mA Internal check failed		• 2.0 s • n _o Continuous uous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .



De- St	lonitor trategy scription	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
B trol	ck Con- Func- Check	tion: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 9,000.0 - 11,700.0° CRK Or Ratio between knock sensor and noise level in pre knock window ≥ 3.50 - 5.0 [-] For time >= 5,760.0 - 6,840.0° CRK Or Ratio between knock sensor and noise level in pre knock window ≥ 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window ≥ 3.50 - 5.0 [-]	Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Mass air flow 100 Mg/stk of 100 Mg/stk o		en AG does not gua	- Check the spark plugs visually for signs of fouling Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
or commercial purposes, in part or in whole, is not be in part or in whole, is not be in the intervention of the intervention	dunes authorised by the sundo	 Fast detection: Ratio between knock sensor and knock threshold in main knock window > 1.50 – 2.50 [-] For time >= 540.0° CRK Or Ratio between knock sensor and noise level in pre knock window > 2.75 – 4.50 [-] For time >= 360.0° CRK Case 1: 	Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Mass air flow > 403.0 – 501.0 mg/stk Misfire detection active Dynamic engine speed not active Delay time n.a. Delay time n.a.	* accept and liability with	aspect to the correctness of inform	Checking", page 1121.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina-	Component Diagnostic Procedure
	Knock Control Function Check	sautho!	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Mass air flow > 403.0 – 501.0 mg/stk Dynamic engine speed not active Delay time n.a. 	• 900.0° CRK • Continuous	• 2 DCY	This DTC may set due to poor fuel quality or fuel that has aged excessively. If necessary, drain the fuel from the vehicle and replace with fresh fuel. Check the spark plugs visually for signs of fouling. Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61- Refer to ⇒ "3.6.21 Knock Sensor 1 G61. Checking", page 1141. Check the Engine Speed Sensor - G28- Refer to ⇒ "3.6.11.
						Engine Speed Sen- sor G28 ,

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Fast detec-	Engine running			Checking",
		tion: Ratio between	ECT @ cylinder block > 60° C			<u>page 1121</u> .
		knock sensor and knock threshold in main knock	• Engine speed 1,216 – 6,400 RPM			
		window > 1.50 - 2.50 [-]	• Engine load n.a. %			
		• For time >= 540.0° CRK	• Mass air flow > 403.0 – 501.0 mg/			
		• Or	stk			
		Ratio between knock sensor	Misfire detection active			
		and noise lev- el in pre knock window > 2.75	Dynamic engine speed not active			
		- 4.50 [-]	Delay time n.a.			
		• For time >= 360.0° CRK				
		• Case 1:				
	60	Ratio between filtered engine roughness volk and misfire N detection	swagen AG does not guarante			
	kedunies suthorised	threshold <= 0.41 - 0.59 [-]	4 ante	Orac-		
	dunles	• Or		COPE		
179.	ŽĮJI.	• Case 2:		11/18/2		
oart or in whole, is not be		Ratio between normalised engine rough- ness and mis- fire detection threshold <= n.a. [-]			th respect to the co	
s, in		• Or			orrec	
rpose		• Case 3:			tness	
oge or commercial pur	What of Olivery of the international states of the interna	 Ratio between filtered engine roughness and misfire detection threshold <= n.a. [-] Or 		Thomas acus	of information	
	* BUIAGO TUBUA	 Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] 	DA Nolkewagen A.G.	100 in		

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P03A F Cylinder 3 Pressure Too High	tion: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 9,000.0 - 11,700.0°	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Mass air flow > 403.0 – 501.0 mg/ stk 	900.0° CRK Continuous	• 2 DCY	 This DTC may set due to poor fuel quality or fuel that has aged exces- sively. If nec- essary, drain the fuel from the vehicle and replace with fresh fuel.
	CRKOrRatio between knock sensor	Dynamic engine speed not activeDelay time n.a.	Volkewaga		Check the spark plugs visually for signs of fouling
	knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] For time >= 5,760.0 - 6,840.0° CRK Or Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and knock sensor and knock window > 2.0 - 3.0 [-] For time >= 12,960.0 - 16,740.0°			adoes not guarante	ing. Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sen-

DTC/	Monitor	Malfunction Cri-	Secondary Parame	Monitoring	MIL Illumina-	
De- scrip- tion	Strategy Description	teria and Thresh- old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure
		Fast detec-	Engine running			Checking",
		tion: Ratio between				page 11213
		knock sensor and knock threshold in main knock	1,216 – 6,400 RPM			
		window > 150 - 2.50 [-]	• Engine load n.a.			
		• For time >= 540.0° CRK	• Mass air flow > 403.0 – 501.0 mg/			
		• Or sodung	stk			
		 Ratio between knock sensor 	Misfire detection active			
		and noise lev- el in pre knock	Dynamic engine			
		window > 2.75 - 4.50 [-]	speed not active			
		• For time >= 360.0° CRK	Delay time n.a.			ikakhoo
		• Case 1:	My Coppi		9	SURDO) *
		Ratio between filtered engine roughness and misfire detection threshold <= 0.41 – 0.59 [-]		_O 9ĵo1 ^Q	-ĐA nagsway	ON AGILIEU MOOD TUUU MOO
		• Or				
		• Case 2:				
		Ratio between normalised engine rough- ness and mis- fire detection threshold <= n.a. [-]				
		• Or				
		• Case 3:				
		Ratio between filtered engine roughness and misfire detection threshold <= n.a. [-]				
		• Or				
		Ratio between normalised engine rough- ness and mis- fire detection threshold <= n.a. [-]				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P03B 9 Cylinder 4 Pressure Too High	Knock Con- trol Func- tion Check	Slow detection: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-]	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % 	• 900.0° CRK • Continuous	• 2 DCY	- This DTC may set due to poor fuel quality or fuel that has aged exces- sively. If nec- essary, drain the fuel from the vehicle
		• For time >= 9,000.0 – 11,700.0° CRK	 Mass air flow > 403.0 – 501.0 mg/ stk 			and replace with fresh fuel. - Check the
		Or Ratio between knock sensor	Dynamic engine speed not activeDelay time n.a.			spark plugs visually for signs of foul- ing.
		and noise level in pre knock window > 3.50 - 5.0 [-]				Check for an engine mechanical fault with a cylin-
	_{red} un ^e	Ratio between knock sensor and noise level in pre knock window > 3.50 – 5.0 [-]	n AG. Volkswagen AG does	not guarantee or a	Celty any	cause a high- er than nor- mal com- pression reading and may contrib- ute to this concern. Re-
	n part or in whole, is not being	knock sensor and noise levill in pre knock window > 3.50 – 5.0 [-] Ratio between knock sensor and knock threshold in main knock window > 2.0 – 3.0 [-] For time >= 12,960.0 – 16,740.0° CRK Or Torque limitation factor < 0.90 [-]			liability with respect to the corr	fer to appropriate repair manual for low compression readings or for carbon buildup removal.
	ate of commercial purposes, i	16,740.0° CRK Or Torque limitation factor < 0.90 [-]			ectness of information in this	- Check the Knock Sensor 1 - G61 - Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141
	THATOLOG	ofected by copyright: Copy	AG. Volkswagen AG does.	_Μ ον γατήδη γορ	La linde	- Check the Engine Speed Sensor - G28- Refer to ⇒ "3.6.11 Engine Speed Sensor G28,

- Fast detection: - Ratio between knock sensor and knock window > 1.50 - 2.50 [-] - For time >= 540.0° CRK - Or - Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] - For time >= 360.0° CRK - Or - Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] - For time >= 360.0° CRK - Case 1: - Ratio between filtered engine roughness and misfire detection threshold <= 0.41 = 0.59 [-] - Or - Case 2: - Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] - Or - Case 3: - Ratio between filtered engine roughness and misfire detection threshold <= n.a. [-] - Or - Ratio between filtered engine roughness and misfire detection threshold <= n.a. [-] - Or - Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] - Or - Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] - Or - Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] - Or - Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] - Or - Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] - Or	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			tion: Ratio between knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Or Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Or Case 2: Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] Or Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] Or Ratio between normalised engine roughness and misfire detection threshold <= n.a. [-] Or	 ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Mass air flow > 403.0 – 501.0 mg/stk Misfire detection active Dynamic engine speed not active Delay time n.a. 			page 1121.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0410 AIR Sys- tem "A"	Air System Functional Check	Diff. pressure value after secondary air injection vs. pressure value before secondary air activation > 5.0 kPa Authorised by Nolke Wagen authori	 General: Secondary air pump ready Catalyst heating active Secondary air injection finished for inished for inished	• Once / DCY	• 2 DCY	 Check the Secondary Air Injection Sensor 1 - G609 Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609. Checking", page 1159. Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101. Checking", page 1157. Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve - N112 - Refer to ⇒ "3.6.32 Secondary Air System GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24. Checking", page 1165.

• 0.5 s • Continuous	• 2°DCY	- Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163
		- Check the Secondary Air System GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 Secondary Air System GX24 Secondary Checking", page 1165 .
• 0.5 s • Continuous	· 2 DCY	- Check the Secondary Air Injection Solenoid Valve - N112 Refer
		to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163. - Check the Secondary Air System - GX24 Re- fer to ⇒ "3.6.32 Secondary Air System
	Carlo	Contin-

DTC / Monitor De- Strategy Scription	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0418 AIR Sys- tem Con- trol "A" Circuit	ware values)	Engine running Actuator commanded off Actuator commanded off Total delivered by the search of the searc	O.5 s Continuous Volkswagen A Volkswagen A	• 2 DCY	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.
		Copyribate or commercial purposes, in part or in whi			Air injection Pump Relay J299 / Sec- ondary Air In- jection Pump Motor V101, Checking", page 1157.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			• ECT > 60° C			
			• IAT > -48° C			
			 Modeled catalyst temp. 500 – 700° C 			
			 Modeled catalyst temp. extended range 470 – 730° C 			
			 Integrated MAF catalyst temp. conditions fulfil- led > n.a. g 			
		gen AG. Vo	Difference be- tween dynamic and stationary catalyst temp. -254.0 – 254.0 K			
	.iedunessauthoris	ed by Volkswago	catalyst temp. conditions fulfilled > n.a. g Difference between dynamic and stationary catalyst temp254.0 - 254.0 K Difference between dynamic and stationary catalyst temp304.0 - 304.0 K Modeled catalyst temperature @ start > 550° C Modeled exhaust gas temperature at O2S rear <= 1,201° C Air mass flow conditions MAF per cylinder extended range 35.0 - 135.0 kg/h MAF per cylinder extended range 35.0 - 135.0 kg/h MAF set point 125.0 - 580.0 mg/rev MAF extended range range n.a. mg/rev Limited dynamics conditions	nice of acceptant.		
ISnore			Modeled catalyst temperature @ start > 550° C		HEY WHAT	
art orin whole			 Modeled exhaust gas temperature at O2S rear <= 1,201° C 		espect to the	
ses, in pa			Air mass flow conditions		correctne	
ial purpo			 MAF per cylinder 40.0 – 130.0 kg/h 		ss of inf	
or commercial purposes, in			MAF per cylinder extended range 35.0 – 135.0 kg/h		ormationin	
	of Building of the State of the		• MAF 125.01 – 580.0 mg/rev	IIIOO IIIOO		
	16 Copy 146	Protected by copy	 MAF set point 125.0 – 580.0 mg/ rev MAF extended 	olikgo, Japa		
		₋₁₇₉ jo19	range n.a. mg/rev Limited dynamics conditions			
			 Dynamic engine speed < 20 RPM 			
			Dynamic lambda controller output <= 20.0%			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Dynamic MAF < 25.01 mg/stk			
			Integrated MAF after dynamic conditions are ful- filled > 20.0 g			
			Evap purge con- ditions			
			• Canister load <= 2.0 [-]			
			• Or			
			Evap purge valve closed			
			Close the gap conditions			
			O2S rear voltage @ diagnosis start >= 0.55 V	jen AG. Volksw	agen AG does not g	Liarante .
			Integrated MAF to start diagnosis n.a.			Oracoept any
		le, is not berm,	O2S front dynamic diagnosis separate not active			Harantee or accept and lighting what
E	EVAP Sys- tem Out Of	Evap pump current during	Barometric pres- sure > 73.0 kPa	624.0 sOnce /	• 2 DCY	- Check the Leak Detec- tion Pump - V144 Refer to ⇒ "3.6.22 Leak Detec- tion Pump
Sys-	Range High	measurement	• AAT 4 to 38° C	DCY		tion Pump - V144 Refer
tem Leak De-		> 40.0 mA	• ECT @ start >= 4° C			to ⇒ "3.6.22 Leak Detec-
tec- tion		al purpose:	 Vehicle speed < 1 km/h 			tion Pump V144
Refer- ence Orifice Low Flow		are of commercial puri	Time since en- gine start in pre- ceding dcy >= 600.0 s			V144, Checking", page 1143
			Difference be- tween ECT and AAT @ start <= 203 K	_34/	9	page 1143.
			• Engine stop (during ECM keep	D ₁ Id	Volkswagen AG.	kajup.
			Airbag not activa- ted			

De-St	lonitor trategy scription	Malfunction Cri- teria and Thresh	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
F tem	AP Sys- Out Of age Low	Evap pump current during reference measurement < 15.0 mA	 Barometric pressure > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start <= 20.3 K Engine stop (during ECM keep alive-time) Airbag not activated 	• 624.0 s • Once / DCY	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144. Checking". page 1143.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0441 EVAP Sys- tem	EVAP Purge Valve Functional Check: Stuck Close	Ratio actual intake manifold pressure and modeled set point intake manifold pressure < 0.05 [-]	 ECT @ cylinder block > 58° C Barometric pressure > 73.0 kPa AAT > 5° C AAT @ start >= 5° C Diff. barometric pressure vs. filtered intake manifold pressure > n.a. kPa Diff. barometric pressure vs. filtered intake 	• 8.5 s • Once / DCY	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 . - Check the Leak Detection Pump -
		nalpur	Diff. ratio MAF @ intake manifold and MAF max vs. ratio filtered MAF @ intake manifold and MAF max < 0.15 [-] Diff. modeled intake manifold pressure vs. filtered modeled intake manifold pressure < 1.50 kPa And Integrated MAF since engine start		vagen AG.	SHOVETHER COPING OF THE THE WANTED WAS
			>= 0.0 – 5,000.0 g • Lambda control active • Lambda control value -30.0 – 30.0%			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			• O2S front 0.95 – 1.05 [-]			
			• Case 1:			
			 Integrated MAF @ canister purge per driving cycle >= n.a. g 			
			• Case 2:			
			 Integrated MAF @ canister purge valve >= 2.1 g 			
			 Ratio MAF @ canister purge and MAF per cyl- inder n.a. 			
			• And			
			 And Depending on AAT: AAT: AAT >= 30° C Canister load <= 0.09 [-] Or AAT >= 20: < 30° 	en AG _{does not}	,	
		ous industrial in the state of	• Canister load <= 0.09 [-]	3	uarantee or acc	
		we during	• Or		Prant	
		The state of the s	• AAT >= 20; < 30° C			Oliji
	. 9/0	1,151,0	• Canister load <= 0.09 [-]			with rest
	rinwh		• Or			pectito
	oart o		• AAT < 20° C			the co
	ses, in p		 Canister load <= 0.27 [-] 			orrectn
	purpo	ido o o o o o o o o o o o o o o o o o o	Protected by o	DA negeweylov	MOTHER HOO THE THOU	with respect to the correctness of Information in this

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
EVAP	EVAP System Small Leak Rationality Check	Difference pump current vs. rough leak reference current < 0 mA And For time >= 600.0 s	 Barometric pressure > 73.0 kPa AAT 4 – 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start <= 20.3 K Engine stop (during ECM keep alive-time) 	• 624.0 s • Once / DCY		- Check the EVAP System for Leaks. Refer to ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6. - Check the EVAP Canister Purge Regulator Valve 1 - N80 - Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump - V144 - Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P0444 EVAP Sys- tem Purge Con- trol Valve "A" Circuit Open	Purge Valve Open Circuit	age lower	 Engine running Evap purge valve opening signal (PWM) > 3.13; <= 98.83% 	• 2.0 s • Continuous	DCX/10V	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0445 EVAP System Purge Control Valve "A" Circuit Shorted	EVAP Purge Valve Short To Ground	Output volt- age (hard- ware values) 1.92 – 2.21 V	 Engine start not active Engine running Evap purge valve opening signal (PWM) <= 98.83% Actuator commanded off 	• 2.0 s • Continuous	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80,
	EVAP Purge Valve Short To Battery Plus	Actuator temperature 160 – 200° C Or School North State Or School North State Output current (hardware values) > 4.0 – 7.0 A	 Engine start not active swagen AG dos Engine running Evap purge valve opening signal (PWM) >= 3.13% Actuator commanded on 	s not guarantes o	RCCROTANIII III	Checking", page 1123 .
P0447 EVAP Sys- tem Vent Con- trol Circuit Open		 Output voltage lower range 1.85 – 2.28 V Output voltage upper range (hardware values) 2.75 – 3.36 V 	manded off	• Continuous	b respect to the correctr	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P0448 EVAP Sys- tem Vent Con- trol Circuit Shor- ted	Detection Pump Valve Short To Ground	Output voltage (hard-ware values) < 1.85 to 2.28 V Actuator temperature > 455 - 185° C Or Output current (hardware values) > 1.0 - 2.0 A	Actuator commanded off Actuator commanded on manded on m	• 2.0 s • Continuous	• 2 DCY ^{mation} inthis Country in the second	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0455 EVAP Sys- tem Leak De- tected (Large Leak)	EVAP System Leak Detected (Large Leak)	Time for pressure drop < 1.0 s Difference Difference	 Time after engine start 12.0 – 65,530.0 s ECT 5 – 120° C ECT at start 5 – 50° C Engine off time > 21,600.0 s Ambient air temp 5 – 59° C Ambient air temp drop after start < 2 k Intake manifold vac. > -2,560 hPa Altitude < 2,700 m Veh. speed >= 0 Veh speed once > 40 km/h Any drive gear Restart temp diff. > 0 K Purge valve closed LDP active 		• 2 DCY	EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump - V144 - Refer to = "3.6.22" Leak Detection Pump V144, Checking",
	EVAP System Very Small Leak Rationality Check	 Difference pump current vs. small leak reference current < 0.0 mA And Pump current measurement time > 600.0 s And Pump current gradient >= 0.30; <= 0.01 mA/s Pump current gradient n.a. 	• AAT 4 – 38° C • ECT @ start >= 4° C • Vehicle speed < 1 km/h	• 624.0 s • Once / DCY	• 2 DCY	page ₹143 . Check the EVAP System for Leaks. Refer to #2.2.4 EVAP System, Checking for Leaks", page 6 . Check the EVAP Canister Purge Regulator Valve 1 - N80 - Refer to #3.6.12 EVAP Canister Purge Regulator Valve 1 N80 - Checking Regulator Valve 1 N80 - Checking", page 1123 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Difference pump current vs. small leak reference cur- rent >= 0.0 mA				- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detec-
		• And				tion Pump
		Pump current gradient n.a.				V144 , Checking", page 1143 .
		• And				
		Ratio between actual pump current and small leak reference pump current < 1.10 [-]		^a dby Volkes	_{vagen} AG. Volksw.	agen AG does not gue.
		Difference pump current vs. small leak reference cur- rent >= 0.0 mA	• EAb bnude	noriseu		War and the second seco
		• And	s, is no			
		• Pump current gradient >= 0.30; <= 0.01 mA/s	oart or <i>in whol</i> e			
EVAP Sys- tem	EVAP System Purge Control Valve "A" Circuit Low	• Signal voltage 0.0 – 3.26 V	EVAP purge valve commanded off Engine speed > 80 RPM		• 2 DCY	EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking",
P0459 EVAP Sys- tem Purge Con- trol Valve "A" Circuit High	tem Purge Control Valve "A" Circuit High	• Signal current > 2.2 A		• 0:5 \$	• 2 DCY	page 1123 . Check the Canis- EVAR Canis- ter Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canis- ter Purge Regulator Valve 1 N80, Checking",

		- 2 ¹			0/-3	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0491 AIR Sys- tem Insuf- ficient Flow Bank 1	ourposes, in pe	Or Leakage: Ratio relative measured secondary air pressure and modeled sec-	pump active Catalyst heating active Secondary air injection active MAF <= 140.0 kg/h ECT @ cylinder block >= -10; < 115° C IAT @ manifold >= -10; < 100° C Modeled catalyst temperature < 700° C Relative barometric pressure > 0.73 [-] And Diff. barometric pressure vs. manifold pressure > n.a. kPa	• O.1 s • Once / DCY	• 2 DCY	- Check the Secondary Air Injection Sensor 1 - G609 - Refer to 3 - G609 - Checking" - Dage 1159 - Check the Secondary Air Injection Pump Relay - J299 / Secondary Air Injection Pump Motor - V101 - Refer to 3 - G609 / Checking" - Dage 1157 - Check the Secondary Air Injection Pump Motor V101 - Checking" - Dage 1157 - Check the Secondary Air Injection Solenoid Valve - N112 - Refer to 3 - G631 / Secondary Air Injection Solenoid Valve - N112 - Refer to 3 - G631 / Secondary Air Injection Solenoid Valve N112 - Checking" - Dage 1163 - Check the Secondary Air System - G724 - Refer to 3 - G724 - Refer to 3 - G724

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0501 Vehi- cle Speed Sen-	cle Speed Sensor CAN Com- munication	Speed sensor fault value: out of range high failure		• 0.5 s • Continuous	• 2 DCY	 Check the vehicle speed signal. Refer to ⇒ "3.6.36 Ve-
sor "A" Circuit Rang e/Per-	With Vehi- cle Speed Sensor	Speed sensor fault value: out of range low failure				hicle Speed Signal, Checking", page 1174.
for- manc e		Speed sensor fault value: ra- tionality check high failure.	_{ad} by Volkswagen AG. Volksy	vagen AG does i	Pot guarantee oraco	- Check the CAN-Bus terminal re- sistance. Re- fer to
		tionality check low failure				3.6.5 CAN- Bus Terminal Resistance, Checking", page 1109.
P0502 Vehicle Speed Sensor "A" Circuit Low	Speed Sen-	• Vehicle speed sensor signal: electrical error failure		• 0.5 s • Continuous	• 2 DCY	- Check the vehicle speed signal. Refer to ⇒ "3.6.36 Vehicle Speed Signal. Checking", page 1174.
		Vehicle speed > 290 km/h			.0	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance,
		746)	Mdoo Ko	0	MOVED THE WAY	Checking", page 1109
Vehi- cle Speed Sen- sor "A" Circuit Inter-	Vehicle Speed Sen- sor "A" Cir- cuit Inter- mittent/Er- ratic/High	• Vehicle speed > 290 km/h	A bə ^j əəjo19	• · · · · · · · · · · · · · · · · · · ·	• 2 DCY	- Check the vehicle speed signal. Refer to ⇒ "3.6.36 Vehicle Speed Signal, Checking", page 1174.
mit- tent/ Errat- ic/ High						- Check the CAN-Bus terminal re- sistance. Re- fer to
						*3.6.5 CAN- Bus Terminal Resistance, Checking", page 1109

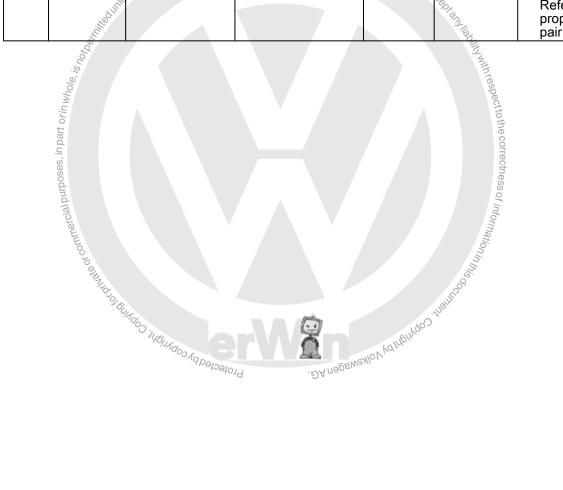
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0506 Idle to Control trol Sys-	Strategy Description Idle Con- troller Func- tion Moni- toring: En- gine Speed Deviation	Diff. actual engine speed vs. engine speed set point < -100 RPM Integrated I-part of idle speed controller n.a.	 ters with Enable Conditions General conditions: Vehicle speed = 0 km/h Torque safety limitation not active Driver request not active Throttle actuator 	Time Length • 10.0 s • Continuous	• 2 DCY	agnostic Proce-
			 Engine load (manual trans- mission only) < 30.47% 			

DTC / Monitor De- scrip- tion Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
Idle troller Func- Con- tion Moni- trol toring: En- Sys- gine Speed tem Deviation	 Diff. actual engine speed vs. engine speed set point > 200 RPM Integrated I-part of idle speed controller n.a. 	tions: Vehicle speed = 0 km/h Torque safety limitation not active Driver request not active Throttle actuator commanded on Evap purge flow < 8.0 kg/h Engine running Time after engine start n.a. Clutch switch n.a. Barometric pressure > 70.0 kPa Catalyst heating not active	• 10.0 s • Contints • Contints Roofis dous	• 2 DCY Nagen AG. Volkswa	Valve Con-	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P050 A	Idle Con- troller Func-	Diff. actual en- gine speed vs.	General conditions:	10.0 sContin-	• 2 DCY	- Check the Throttle
Start Idle	tion Moni- toring: En- gine Speed	engine speed set point > 200 RPM	• Vehicle speed = 0 km/h			Valve Con- trol Module - GX3 Refer
Con- trol Sys- tem	Deviation	Integrated I- part of idle speed control-	Torque safety limitation not ac- tive			to ⇒ "3.6.34 <u>Throttle</u> Valve Con-
Per- for- manc		ler n.a.	Driver request not active			trol Module GX3, Check-
е			Throttle actuator commanded on			<u>ing",</u> page 1169 .
			• Evap purge flow < 8.0 kg/h			
			Engine running			
			Time after engine start n.a. AG. Volkey	vagen AG do _{es i}	not guarantee or accep	
		porie	Clutch switch n.a.		" Guarante	
		Lynessauth	Barometric pres- sure > 70.0 kPa		C Or accep	} -
		osimino osimin	Catalyst heating active			8th lighting
		le, is not	ECT @ cylinder block > -10° C			NWITH TES
		who	• And			spect
		purposes, in part or in whole, is not be mile by the state of the stat	• Set point change < n.a. RPM			totheco
		u,se,in	• For time >= n.a. s			orrect
		rpose	• And			iness
		ercial pu	Additional conditions:			of infor
		mmc	For time n.a.			natio
		1010 arenidios	Gear switch not active (automatic transmission on- ly)			nin this ob
		Popurpose or commercial purpose of commercia	Or Driver request not active Or Or	. DA nagewa	MOV WOTH BINGOD THE	to the correctness of information in this occur.
			Vehicle speed 0 km/h			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
tion	<u>.</u>	Diff. actual engine speed vs. engine speed set point < -100 RPM Integrated I-part of idle speed controller n.a. Sunlassaumorised by Volks V	 General conditions: Vehicle speed = 0 km/h Torque safety limitation not ac- 	pes not guarante		to the correctness

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring I Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P050 B Cold Start Igni- tion Tim- ing Per- for- manc e	Ignition Control Ig- nition Tim- ing Monitor @ Idle	Difference between commanded ignition timing efficiency vs. actual value > 20.0% Saturnorised by Volkswage	 @ idle active Commanded ignition timing efficiency during catalyst heating <= 80.0% Fuel-fed overrun active Or Engine idle Pressure ratio @ throttle <= 1.0 [-] Delta mass air flow set point n.a. 	• 6.0 s • Once / DCY	• 2 DCY	 Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169. Check for any engine speed sensor or ignition coil faults and diagnose them first. If no other codes are set, replace the Engine Control Module - J623 Refer to appropriate repair manual.



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure
						Checking", page 1105
P053 F Cold Start Fuel Pres- sure Per- for- manc e Bank 2	Fuel Sys- tem Out Of Range Low	 Deviation between set point and actual fuel pressure > 1500.20 kPa For time >= 3.0 s 	 General: Engine speed > 608 RPM And Fuel mass set point lower range > 1.99 mg/rev For time >= 5.0 s And 	• 5.0 s • Once / DCY	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/ or to appropriate repair manual.

	1	Г	WEMAS	G. Volkswager	V000-	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel System Out Of Range High	Deviation between set tween set point and actual fuel pressure < -1500 20 kPa For time >= 3.0 s	 Fuel mass set point upper range < 100.32 – 172.41 mg/rev Or Fuel mass set point gradient n.a. For time n.a. And Additional for catalyst heating: Catalyst heating active ECT @ cylinder block > -48° C Time after engine start > 3.0 s Fuel mass set point lower range >= 5.00 mg/rev For time >= 3.0 s 	G.	A Nokewagen A	- Check the Fuel Pressure Sensor-G247- Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131 - Check the Fuel Pressure Regulator Valve - N276- Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129
P056 E Cold Start Tur- bo- charg- er/Su- per- charg- er Boost Con- trol "A" Per- for- manc e	Turbo-charger Boost Pressure Control Valve Functional Check - Slow Response	Boost pressure actuator position controller output > 98.0% Boost pressure actuator position controller output < -98.0% -98.0%	 Time after engine start >= 4.0 s ECT > -10° C AAT > -10° C Catalyst heating active Boost pressure control active 	• 0.4 s • Continuous	• 2 DCY	- Check the Charge Air Pressure Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113. - Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249, Checking", page 1172. - Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	St. Edd little Mills
	Turbo- charger Boost Pres- sure Con- trol Valve Functional Check	Deviation boost pres- sure actuator position con- troller > 12.0 – 100.0%	 Time after engine start >= 4.0 s ECT > -10° C AAT > -10° C Difference between actuator position set point in normal mode and during catalyst heating > 0.0% Catalyst heating active Boost pressure control active 	(B) LODALIO	ou _d	Pressure Sensor G31, Checking", page 1115	act and liability with respect to the correctness of information in this double by.
	Active Grille Air Shutter Functional Check	Blocked active grille air shutter detected Functional check uncontrolled adjustment detected	• AAT > 5; < n.a.° C	0.3 s Continuous	• 2 DCY	- Check the Radiator Shutter Motor - V544 - Refer to ⇒ "3.6.27 Radiator Shutter Motor V544 , Checking", page 1155 .	
P05A 2 Active Grille Air Shut- ter "A" Con- trol Cir- cuit/ Open	Active Grille Air Shutter Open Cir- cuit	 Signal voltage lower range > 1.92 - 2.21 V Signal voltage upper range < 2.85 - 3.25 V 		0.5 s Continuous	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544- Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544 Checking", page 1155	
P05A 3 Active Grille Air Shut- ter "A" Con- trol Circuit Rang e/Per- for-	Active Grille Air Shutter Functional Check	Internal logic failure detected Initialisation failure detected		0.3 sContinuous0.0 sContinuous	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544, Checking", page 1155.	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
manc e	Active Grille Air Shutter Activity Check	Active grille air shutter controller feedback sig- nal failed		• 24.0 s • Continuous		
P05A 4 Active Grille Air Shut- ter "A" Con- trol Circuit High	Battery Plus	 Power stage temperature > 160.0 - 200.0° C Or Signal current > 4.0 - 7.0 A 		0.5 s Continuous	• 2 DCY	- Check the Radiator Shutter Motor - V544 - Refer to ⇒ "3.6.27 Radiator Shutter Motor V544 , Checking", page 1155 .
P05A 5 Active Grille Air Shut- ter "A" Con- trol Circuit Low		< 1.92 – 2.21 V	signal voltage > 3.3 s • Active grille air shutter feedback failure not detected	Continuous	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544, Checking", page 1155.
Grille Air Shut- ter Mod- ule "A"	Air Shutter Functional Check	Internal over- ted Internal over- temperature detected	n AG does not guarantee or acce	0.3 s Continuous Additional light ligh	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544, Checking", page 1155.
Temperature P0601 Internal Control Module Memory Check sum	Checksum Verification	 Calibration checksum incorrect Software checksum incorrect 		1.0 s to the continuous of information in this continuous of information in the continuous	• 2 DCY	Replace the Engine Control Module - J623 Refer to appropriate repair manual.
Inter-	ECM: Communication Check	• SPI communication with ATIC failure	A nagewayley Volkewagen A	• © 2.0 s	• 2 DCY	Replace the Engine Control Module - J623 Refer to appropriate repair manual.

ECM: Injection Valves iton Valves iton Valves iton Valves iton Calibration during initialisation failure - Calibration during initialisation failure - Hardware during initialisation failure - Time reference from microcontroller and SDI-Driver powerstage failure - Time reference from microcontroller and SDI-Driver powerstage failure - Time reference from microcontroller and SDI-Driver powerstage failure - Time reference from microcontroller and SDI-Driver powerstage failure - Time reference from microcontroller and SDI-Driver powerstage failure - Time reference from microcontroller and SDI-Driver powerstage from microcont
during initialisation failure • Hardware during initialisation failure • Time reference from microcontroller during initialisation failure • Communication between microcontroller and SDI-Driver powerstage failure • Time reference from microcontroller and SDI-Driver powerstage failure • Time reference from microcontroller during initialisation failure • Time reference from microcontroller during initialis
ing initialisation failure • Time reference from microcontroller during initialisation failure • Communication between microcontroller and SDI-Driver powerstage failure • Time reference from microcontroller and SDI-Driver powerstage failure • Time reference from microcontroller during initialisation failure • Time reference from microcontroller during initialisation failure • Continuous • Time reference from microcontroller during initialisation failure • Continuous • CRK • Once / DCY • CRK • Once / DCY • CRK • CRK • CRK • CRK • CRK • COntinuous • 2880.0° • CRK • Once / DCY • CRK • CRK • COntinuous
ence from microcontroller during initialisation failure • Communication between microcontroller and SDI-Driver powerstage failure • Time reference from microcontroller during initialisation failure • Time reference from microcontroller during initialisation failure • Time reference from microcontroller during initialisation failure • 2880.0° CRK • Continuous • 360.0° CRK • Once / DCY • 2880.0° CRK • Once / DCY • 2880.0° CRK • Continuous • 2880.0° CRK • Once / DCY • CRK • Once / DCY • CRK • Continuous
tion between microcontroller and SDI-Driver power-stage failure • Time reference from microcontroller during initiali-
Time reference from microcontroller during initialia. Time reference from microcontroller during initialia. Separation of the continuation of the conti
Time reference from microcontroller during initialiar Time reference from microcontroller during initialiar du
sation missing uous
sation missing • Communication between microcontroller and SDI-Driver power-stage failed • Continuous • 4320.0° CRK • Continuous • Continuous • A320.0° CRK • Continuous

DTC / Monitor Strategy Scription Old Value Conditions Secondary Parameters with Enable Conditions Secondary Parameters with Enable Conditions Secondary Parameters with Enable Conditions Secondary Parameters Williams Time Secon
P0606 Barometric Control Pressure Charged engine Check Process Sor Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa Diff. BARO vs. MAP Mean value vs. MAP Mean value SARO mean value BARO mean value

DTC / De- scrip- tion	Monitor Strategy Description		falfunction Cri- ria and Thresh- old Value	S	econdary Parame- ters with Enable Conditions		onitoring Time Length	MIL	Illumina- tion	Component Diagnostic Procedure
		•	Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa	•	Engine stopped Vehicle speed < 1 km/h ECM keep alive- time 10.0 – 6,553.5 s Time after engine stop >= 5.0 s BARO sensor voltage 0.20 – 4.80 V MAP sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V					
	Barometric Pressure Sensor Out OF Range High	•	Measured barometric pressure > 115.0 kPa		and	• • • •	5.0 s Continuous	140		tiee or accept and liability with respecti
	Barometric Pressure Sensor Out OF Range Low	•	Measured barometric pressure < 45.0 kPa	S. S	authorised by Volkswagen A		901	r A G d	oes not guarã	nice oracc
	Knock Control Internal Hardware Check	•	Knock control malfunction signal acquisition error	•	Engine running	•	6.4 s Continuous	7		Stand light mitt
	ECM: EE- PROM Check	•	EEPROM information failure			•	uous			respect to the
			ourposes, in part			•	1.0 s Once / DCY			on econes of
	ECM: Random Access Memory (RAM) Internal Hardware Check	•	RAM error detected	•	Microcontroller failure Reset counter > 1.0 [-]	•	0.04 s Once / DCY			Thess of information in this cool, the state of the state
	ECM: Random Access Memory (RAM) Functional Check		×	SUM	Protected by copyright, cog		0.01 s Continuous	Ansp	ewsylo Nkgyl	pindoo juar

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		ECM: A/D Converter Function Monitoring: A/D Con- verter	• Diff. A/D- channel 1 vs. A/D channel 2 > 0.30 V		• 0.5 s • Continuous		
		ECM: Com- munication Check	SPI communi- cation with ATIC failed	Time after ignition on >= 1.0 s	10.0 sContinuous		
			SPI communi- cation with ATIC implau- sible				
		ECM: Electronic Throttle Control Module Function Monitoring: Torque	Monitoring of difference be- tween actual and set point torque value engine torque overflow > 45.0 – 350.0 Nm	Throttle actuator commanded on	• 0.5 s • Continuous		
	ies sauth	ijsetby Volkswag	Monitoring of torque differ- ence integra- tion integrated engine torque > 550.0 Nm	does not guarantee or do	0.01 sContinuous		
or in whole, is hot be white,		ECM: Electronic Throttle Control Module Function Monitoring: Engine Speed Limitation	• Engine speed > 1,760 RPM	 Engine speed limitation active Injection active 	• 0.5 s Continuous Continuous		
oivale of commercial purposes, in part or in who,		ECM: Electronic Throttle Control Module Function Monitoring: A/D Converter	Internal check failed		Other Continuous Other Continuous		
to to alento	P0607 Con- trol Mod- ule	Barometric Pressure Sensor Short To Ground	 Barometric pressure sen- sor voltage < 0.20 V 	ikaurodi	•ِ≥ 0.5 s	• 2 DCY	 Replace the Engine Con- trol Module - J623 Refer to appropri-
	for- for- manc e	Barometric Pressure Sensor Short Toplogram Battery Plus	Barometric pressure sensor voltage > 4.80 V	DEWEMOVUOMENTOOS			ate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P062 B Inter- nal Con- trol Mod- ule Fuel Injec- tor Con- trol Per- for- manc e	Internal Control Module Fuel Injector Control Performance	Internal logic failure Output Description Descri	• Engine speed > 80 RPM	• 2.2 s	• 2 DCY	Replace the Engine Control Module - 623 Refer to appropriate repair manual.
P0634 Control Module Internal Temperature "A" Too High	Turbo- charger Boost Pres- sure Con- trol Valve Over Tem- perature	Bypass valve driver temper-ature (hard ware values) > 170 – 190° C	• Control valve commanded on	Out s Continuous Uous Uous	• DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
Throt- tle Ac- tuator Con- trol	Throttle Actuator Basic Settings Adaptation Value Monitoring	Battery volt- age <= 9.04 V	TPS adaptation commanded on	0.01 s Once per life-time	• 2 DCY	- Check the Throttle Valve Con- trol Module - GX3 Refer to
Rang e/Per- for- manc e Bank 1	Throttle Actuator Basic Settings Adaptation Value Moni- toring (Start Check)	tween actual TPS 1 or 2 voltage and voltage reference position > 0.07 V • Difference between actual throttle and	 Throttle start check active Accelerator pedal value < 99.9% Engine speed < 64 RPM Vehicle speed < 2 km/h IAT > 5° C 	• 0.01 s • Once / DCY		⇒ "3.6.34 Throttle Valve Con- trol Module GX3, Check- ing", page 1169.
		reference po- sition > 0.503° TPS	• ECT 5 – 101° C			
	Throttle Actuator Basic Settings Adaptation Value Monitoring (Top Limit)	Difference be- tween actual throttle and reference po- sition > 0.503° TPS	 active Accelerator pedal value < 99.9% Engine speed < 64 RPM 			
			 Vehicle speed < 2 km/h 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Difference be- tween actual TPS 1 or 2 voltage and voltage refer- ence position > 0.07 V	• IAT > 5° C • ECT 5 – 101° C			
	Throttle Actuator Basic Settings Adaptation Value Monitoring (Bottom Limit)	Difference be- tween actual throttle and reference po- sition > 0.503° TPS		. O Malliani		
	,	Difference be- tween actual TPS 1 or 2 voltage and voltage refer- ence position > 0.07 V	Bunlass authorised by Volkswage	n AG. Volkswa	gen AG _{does not} _{gu}	arantee or accept and like
	Throttle Actuator Basic Settings Adaptation Value Monitoring (Mechanical Stop Low)	 TPS 1 voltage 0.40; > 0.80 Or TPS 2 voltage 4.20 V 	Bungssaumorised by Volkswage			IIIN With respect to the correct
	Throttle Actuator Basic Settings Adaptation Value Monitoring (Limp Home Position)	Difference between actual TPS 1 or 2 voltage and voltage reference position > 0.25 V				iness of information in this co
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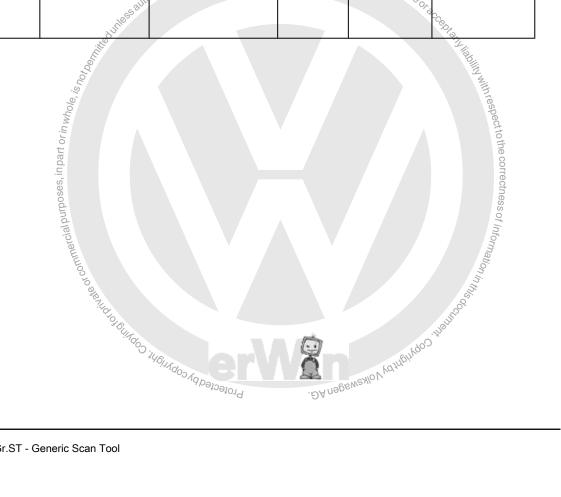
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Throttle Actuator Basic Settings Adaptation Value Monitoring	pedal value > 99.9% Or Engine speed > 64 RPM	TPS adaptation commanded on authorised by Volkswagen AG authorised	 0.01 s Once per life-time 	G does not guarante	- If a related
P0641 Sen- sor Refer- ence Volt- age "A" Cir- cuit/ Open	Sensor Reference Voltage "A" Circuit/Open	deviation > +/-	Protected by copyright, Copyright		· 2 DCY	sensor volt- age code is also set, re- fer to that sensor for di- agnosis first. If no other re- lated codes set, replace
P0642 Sen- sor Refer- ence Volt- age "A" Circuit Low	ECM: 5V Supply Volt- age Out Of Range Low	Analog output 1 supply volt- age < 4.62 V		• 0.2 s • Continuous	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.

DTC/	Monito-	Molfunction Cri	1.01109	Volkswagen AG	14096 AHI	Component D:
DIC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Militumina- tion	Component Diagnostic Procedure
	ECM: 5V Supply Volt- age Out Of Range High	Analog output 1 supply voltage > 5.43 V Analog output 1 supply voltage		• 0.2 s • Continuous	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623. Refer to appropriate repair manual.
P0651 Sen- sor Refer- ence Volt- age "B" Cir- cuit/ Open	Sensor Reference Voltage "B" Circuit/Open	Signal voltage deviation > +/- 0.3 V Only Onl	Protected by copyright; Co	. 0.5 s	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
Sen- sor Refer- ence Volt- age "B" Circuit Low	ECM: 5V Supply Volt- age Out Of Range Low	Analog output 2 supply volt- age < 4.62 V		• 0.2 s • Continuous	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
P0653 Sen- sor Refer- ence Volt- age "B" Circuit High	ECM: 5V Supply Volt- age Out Of Range High	Analog output 2 supply volt- age > 5.43 V		• 0.2 s • Continuous	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.

	<u> </u>					
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
orinw		V	Relay commanded off Volkswagen AG does not get		ablity with respect to	- Check the Motronic Engine Control Module Power Supply Relay - J271 - Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145.
P0658 Actua- tor suppodured Voltage "A" Circuit Low	Supply Voltage Relay Engine Components Short To Ground	• Output voltage (hard- ware values) < 1.90 – 2.28 V	Relay commanded off	l• 10s	2 DCY 2 DCY 2 DCY	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145 .
P0659 Actua- tor Sup- ply Volt- age "A" Circuit High	Supply Voltage Relay Engine Components Short To Battery Plus	 Output current > 1.0 = 2.3 A Or Actuator temperature (hardware values) > 175 – 195° C 	ged ou	Continuous		- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145 .
ECM/ PCM	Main Relay Rationality Check Dur- ing Engine Off Main Relay Short To Ground	Sensed circuit voltage > 6.0 V Output voltage < 1.85 – 2.28 V (hardware values)	 Main relay commanded off For time >= 0.3 s Relay commanded off For time > 40 ms 	0.1 sContinuous0.2 sContinuous	• 2 DCY	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control
						Module Pow- er Supply Relay J271, Checking", page 1145.

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	ECM/ PCM Power Relay	Main Relay Rationality Check Dur- ing Engine On School	• Sensed circuit voltage < 5.0 agen M.G. Volkswagen A	• Main relay commanded on Garage Suggestion of Suggestion	• 0.1 s • Continuous	• 2 DCY	 Check the Motronic En- gine Control Module Pow- er Supply
r in whole, is not bern	Circuit High	Main Relay Short To Battery Plus	 Main relay driver temperature > 175 – 195° C Or Main relay output current > 1.0 – 2.3 A (hardware val- 	 Main relay commanded on For time >= 0.4 s 	O.2 s Continuous		Relay - J271 Refer to ⇒ "3.6.23 Motronic En- gine Control Module Pow- er Supply Relay J271, Checking", page 1145
ove ot commercial purposes, in part or in whole, is not been	Onon	Sensor Reference Voltage Circuit Open	• Signal voltage deviation > +/- 0.3 V	negeweylo Vollery Voor French	the co s ectness of information in this co	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
	Sen- sor	ECM: 5V Supply Voltage Out Of Range Low	വൃAnalog output, 3 supply volt- age < 4.62 V	^Π ΘQSW _{R-M} .	• 0.2 s • Continuous	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description		alfunction Cri- a and Thresh- old Value	S	econdary Parame- ters with Enable Conditions		onitoring Time Length	MI	L Illumina- tion	Co	omponent Di- nostic Proce- dure
P0699 Sen- sor Refer- ence Volt- age "C" Circuit High	ECM: 5V Supply Volt- age Out Of Range High	;	Analog output 3 supply volt- age > 5.43 V			•	0.2 s Continuous	•	2 DCY	-	If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 Refer to appropriate repair manual.
P117 A Bank 1, Oxy- gen Sen- sor Cor- rec- tion Cen- ter Sen- sor Con- ter Limit	Bank 1, Oxygen Sensor Cor- rection Center Sen- sor Control Limit Reached	 t	I portion of 3rd lambda con- trol loop > 0.030	•	Engine speed 1,200 – 4,000 RPM Modeled exhaust gas temp 350 – 1,000 °C Engine load 21.8 – 99.8% 1st, 2nd, 3rd lambda control in closed loop O2S rear and heater ready, no	ksw	1,800 s		2 DCY	-	Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sen- sor 1 After
Reach ed			Aurilessaur						30r à	CCO	* %



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P12A 1 Fuel Rail Pressure Sensor Inappropriate- ly Low	tem Pressure Sensor, High Pressure Senside Rationality Check Low	put > 8 mg	 Engine speed > 608 - 1,088 RPM Mass fuel flow set point 1.99 - 20.01 mg/rev For time after request for mass fuel flow set point >= 5.0 s Time after engine start > 5.0 s Engine warm-up n.a. Catalyst heating n.a. Full load n.a. Catalyst purge n.a. Lambda control closed loop Evap purge functionality diagnosis and a. And Choice of: Canister load <= n.a. [-] Or Evap purge valve n.a. 	• 1.0 s • Continuous	• 2 DCY	- Check the Fuel Pressure Sensor-G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247. Checking", page 1131.
	orgal purposes, in part	S. Salling of British of Strate of S	Dolected by colored	DA N9 US WE WILL	KQIMBIMGO ilusimod	nability with respect to the correctness of information in this contact to the correctness of the correctnes

tion	old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure
P12A 2 Fuel System Pressure Sensor, High Pressure Side Rationality Check High High	pat 4 To mg	quest for mass fuel flow set point >= 5.0 s Time after change to DFI n.a. Time after engine start > 5.0 s Engine warm-up n.a. Catalyst heating n.a. Full load n.a. Catalyst purge n.a. Lambda control closed loop Evap purge functionality diagnosis n.a. And	• 10.0 s • Continuous	• 2 DCY	- Check the Fuel Pressure Sensor - G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 , Checking", page 1131 .
296 Rep. Gr.ST - 0	Generic Scan Tool	Moorled belonged by Marie Colors	- DA nagen AG.	ne A Aquandoo inau	ky with respect to the correctness of information in this occur.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P12A 4 Fuel Rail Pump Control Valve Stuck Close d	tem Pressure Sensor, High Pressure Side Out Of Range High	Deviation between fuel pressure set point and current fuel pressure < -2,000.10 kPa Fuel mass controller output -50.0 – 50.0% Case 1: High pressure controller output < -30 mg Flow control valve open Mass fuel flow set point > 15.01 mg/stk	 Engine speed > 608 - 6,816 RPM Mass fuel flow set point 15.01 - 1,389.0 mg/rev For time after request for mass fuel flow set point >= 5.0 s Engine start not active Time after engine start > 5.0 s Engine warm-up n.a. Catalyst heating not active Full load n.a. Catalyst purge n.a. Lambda control n.a. Evap purge functionality diagnosis n.a. And Choice of: Canister load <= n.a. [-] Or Evap purge valve n.a. 	• 5.0 s • Continuous	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276. Checking", page 1129 Check the Fuel Pressure Sensor G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247. Checking", page 1131.
P13E A Cold Start Ignition Timing Performanc e Off Idle	Ignition Control Ig- nition Tim- ing Monitor @ Part Load	Difference between commanded ignition timing efficiency vs. actual value > 12.0%	 Catalyst heating @ part load active Commanded ignition timing efficiency during catalyst heating <= 88.0% Engine part load Delta mass air flow set point n.a. Delta engine speed n.a. Vehicle speed > 2 km/h 	• 5.0 s • Once / DCY	ZBCI	sensor volt- age code is also set, re- der to that sensor for di-

Timer Performance gine Off time and ECM after run time <a <a="" a"="" active="" actuator="" adapt<="" adaptation="" after="" and="" check="" circuit="" control="" e="" ecm="" formance="" href="text-align: left formance of time and ECM after run time active of ECM, and green formance of inputs to time active or in time active</th><th>DTC /
De-
scrip-
tion</th><th>Monitor
Strategy
Description</th><th>Malfunction Cri-
teria and Thresh-
old Value</th><th>Secondary Parameters with Enable Conditions</th><th>Monitoring
Time
Length</th><th>MIL Illumina-
tion</th><th>Component Diagnostic Procedure</th></tr><tr><td>Throttle Actuator " left="" motor="" not="" of="" per-manc="" range="" rationality="" run="" td="" text-align:="" throttle="" time=""><td>A En- gine Off Timer Per- for- manc</td><td>Timer Per-</td><td>tween engine off time and ECM after run time < -12.0 s</td><td>after run time active Key on during ECM after run time active</td><td>• 6.0 s</td><td>• 2 DCY</td><td>B+ is lost to ECM, this code will set. Check power and ground inputs to ECM first. Refer to Wiring Diagrams for pin locations. If all</td>	A En- gine Off Timer Per- for- manc	Timer Per-	tween engine off time and ECM after run time < -12.0 s	after run time active Key on during ECM after run time active	• 6.0 s	• 2 DCY	B+ is lost to ECM, this code will set. Check power and ground inputs to ECM first. Refer to Wiring Diagrams for pin locations. If all
P1609 Airbag Crash Safety Opening angle for electronic throttle control > 2.998 – 24.982° TPS • Difference between throttle position set point and throttle flap opening angle <= 1.999; > -1.999° TPS • Difference between throttle position set point and throttle flap opening angle <= 1.999; > -1.999° TPS • O.0 s • 2 DCY — After propagation of the position of the position set point and throttle flap opening angle <= 1.999; > -1.999° TPS	Throt- tle Ac- tuator "A" Con- trol Motor	tuator Out		not at min. value			Throttle
P1609 Airbag • Airbag(s) acti- Crash Safety • Vated • 0.0 s • 2 DCY - After property of the continuous co	Rang e/Per- for- manc	tuator Ra- tionality Check	tween throttle position set point and throttle flap opening angle for electronic throttle control > 2.998 –	Difference be- tween throttle po- sition set point and throttle flap opening angle <= 1.999; > -1.999°	• 0.5 s • Continuous	**Antee Or acceptan	Valve Control Module GX3, Checking", page 1169.
Off Was Triggered Varion Due To Crash With Airbag Activation Was Triggered Varion Uous Uous erase the gine Co Module 1623- Death of the Was Activation Airbag Activation Refer to 3.3.4 agnosti Mode Office Company Activation Airbag Activation	Crash Shut- Off Was Trig-	Measures Due To	vated		Continuous	• 2 DCY	- After proper repair of damage, erase the Engine Control Module - J623- DTC. Refer to \$\infty\$ "3.3.4 Di-

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
A Load- ing	Change	Transport mode active	 Vehicle speed < 5 km/h Max trip mileage since initial vehicle start-up < 100.0 km during ECM keep alivetime after ignition off Engine speed 0 RPM Production mode not active For hybrid: Drive motor off 	Continuous	• 1 DCY	- Vehicle is in Transport Mode (Loading Mode). It can be turned off with a scan tool or will automatically switch off after approximately 100 km (62.15 miles) have accumulated on the vehicle. May need to perform readiness check. Refer to ⇒ "3.2 Readiness Code", page 14.
	Intake Manifold Runner Flap Actua- tor Stuck Open	Signal voltage > 0.70 V For time >= 1.5 s Signal voltage > 0.70 V Total part or in whole, is not only the part of the part	Flap commanded off Time after engine start > 5.0 s Addinger authorized by Volkswa	Continuous gen AG. Volksw	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336 Refer to "3.6.19 Intake Manifold Runner Position Sensor G336. Checking", page 1137 . Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316. Checking", page 1135 page 1135 page 1135
			That of Billydon in the indeposit of the formation of the indeposit of the	and and	.ĐA nagenveylov	page 1135 an

P2006 Int		old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure	
Intake Ma Mani- Ru fold Fla Run- tor	anifold unner	 Signal voltage < 0.70 V For time >= 1.5 s 	 Flap commanded on Time after engine start > 5.0 sec. 	• 0.2 s • Continuous	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137. - Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316 , valve N316,	
Mani- Ru fold Fla Run- tor	anifold unner ap Actua- r Open ircuit	Output voltage lower range 1.92 – 2.21 V Output voltage upper range (hardware values) 2.85 – 3.25 V America Scan Tool	Engine running Actuator com-wage Manded off			Checking", page 1135. - Check the Intake Manifold Runner Control Valve - N316 Refer to	
300 Ren Gr ST - Generic Scan Tool							

Intake Manifold Munner Flap Actua-Flap Actual Cornctrol Circuit Low Bank 1 P2010 Intake Intake Manifold Manifold Manifold Runner Flap Actua-Flap Actual Cornor Control Circuit Low Bank 1 P2010 Intake Intake Manifold Manifold Manifold Runner Flap Actual Fla	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
take Manifold Runner Position Sensor - G336 - Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336 - Checking", page 1137 P2010 Intake Manifold Intake Manifold Manifold Runner Fold Runne	Intake Manifold Runner Control Circuit Low Bank	Manifold Runner Flap Actua- tor Short To	age (hard- ware values <	Actuator com-	• Contin-	• 2 DCY	fold Runner Control Valve - N316 Refer to ⇒ "3.6.18 In- take Mani- fold Runner Control Valve N316, Checking",
P2010 Intake Manifold Manifold Runner fold Runner Control Circuit High Bank 1 Power stage of Engine running temperature > 160 + 200° C Output current (hardware values) > 4.0 - 7.0 A Power stage of Engine running temperature > 160 + 200° C Output current (hardware values) > 4.0 - 7.0 A Power stage of Engine running temperature > 160 + 200° C Output current (hardware values) > 4.0 - 7.0 A Power stage of Engine running temperature > 160 + 200° C Output current (hardware values) > 4.0 - 7.0 A Power stage of Engine running temperature > 160 + 200° C Output current (hardware values) > 4.0 - 7.0 A Power stage of Engine running temperature > 160 + 200° C Output current (hardware values) > 4.0 - 7.0 A Check the Intake Manifold Runner Position Sensor - G336 - Refer to 3 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 3 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 3 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Position Sensor G336 . Refer to 5 **36.19 Intake Manifold Runner Runner Runner Runner Runner Runner Runner Runner Runner Runne				anen AG. Volkswagen AG			fold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336,
Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor - G336 . Checking"	Intake Mani- fold Run- ner	Manifold Runner Flap Actua- tor Short To Battery Plus	temperature > 160, +200° C Or Output current	 Engine running Actuator commanded on 	• Conting uous		Checking",
page 1137.		ot commercial purposes, in par	Audio Buildos 746			Judo O Ju	Check the In- take Mani- fold Runner

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake Manifold Runner Flap Posi- tion Sensor Short To Ground / Open Cir- cuit	Intake manifold runner flap position sensor voltage < 0.20 V	Engine start not active	0.04 s Continuous	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336- Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137.
		, ₇ / ₇ / ₇	nised by Volkswagen AG. Vol	kswagen AG do	es not guarantee	 Check the Intake Manifold Runner Control Valve - N316 Referto
		in so			O'at	⇒ "3.6.18 In- take Mani- fold Runner Control Valve N316, Checking", page 1135.
Mani- fold Run- ner Posi- tion	Manifold Runner Po- sition Sen- sor/Switch Circuit Range/Per-	ner flap target position vs actual position > 25% • gActual posi-	on or off • Adaptation ready	• 1.5 s	2 001	take Manifold Runner Position Sensor G336- Refer to ⇒ "3.6.39 Intake Manifold Runner Position Sensor G336. Checking", page 1137.
manc e Bank 1		Sound leistemmoor to alendro faill do se	Protected by copyright	SOR NO SOR	Mes Mo V Varing Tudo)	Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina-	Component Diagnostic Procedure
	Intake Manifold Runner Po- sition Sen- sor/Switch Circuit Low Bank 1	• Signal voltage < 0.25 V Signal voltage vs. in part or in whole, is not only the signal of the sign	• Engine start not active	• 0.3 s	• 2 DCY	Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336. Checking" page 1137. - Check the In-
		oommeroi of commercity of the commercial of the	Protected by Copyright; Co	.ĐAn	эбемэжол Кайдий	take Manifold Runner Control Valve N316 Refer to 3.6.18 Intake Manifold Runner Control Valve N316 Checking page 1135
	Intake Manifold Runner Flap Posi- tion Sensor Short To Battery Plus	Intake manifold runner flap position sensor voltage > 4.80 V	Engine start not active	0.04 s Continuous	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336. Checking", page 1137.
'						- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	"A" Cam- shaft Posi- tion Actua- tor	VVT Actua- tor Intake Short To Ground	Output volt- age hardware values) < 1.92 - 2.21 V Olkswagen AG. Volkswa	• Actuator commanded off	• 2.0 s • Continuous	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 .
n part or in whe,	is not be milled.	VVT Actuator Intake Short To Battery Plus		gen AG does not guarantee or		66	Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 , Checking", page 1105 .
secial purposes,	tor Con- trol		(hardware val- ues) > 8.0 – 12.0 A	Actuator commanded on	• 2.0 s • Continuous • Continuous	2 DCY	- Check the Camshaft Position Sensor - G40- Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107
	1	(BURDO) HOUNDOO!	Protected b	DA nagewayloV vahbiyyage			- Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205, Checking", page 1105.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure
P2096 Post Cata- lyst Fuel Trim Sys- tem Too Lean Bank 1	Fuel Sys- tem Out Of Range Low	Adaption value < -0.05 [-] Adaption value of commercial purposes, in part or in whole, is not being the purposes. Adaption value of commercial purposes, in part or in whole, is not being the purpose of the purpose. Adaption value of commercial purposes, in part or in part of the purpose of the pur	 2nd lambda control closed loop vol Cat purge not active Combustion mode change not active Engine speed >= 704 RPM Integrated mass for fuel in oil < 255.0 [-] Choice of: O2S rear (binary) check not active Or O2S rear (binary) check finished 	• 81.0 s		- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in **3.1 Preliminary Check* page 13 and/or to appropriate repair manual. - Check the Oxygen Sensor 1 After Catalytic Converter - GX7 - Refer to **3.6.25 Oxygen Sensor ↑ After Catalytic Converter Catalytic Convert
P2097 Post Cata- lyst Fuel Trim Sys- tem Too Rich Bank 1	Fuel Sys- tem Out Of Range High		 2nd lambda control closed loop Cat purge not active Combustion mode change not active Engine speed >= 704 RPM Integrated mass for fuel in oil < 255.0 [-] Choice of: O2S rear (binary) check not active Or O2S rear (binary) check finished 	• 81.0 s • Continuous	• 2 DCYNOO	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Oxygen Sensor 1 After Catalytic Converter GX7 - Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Throttle Actuator Open Circuit	Electronic throttle valve driver load resistance > 200.0 kΩ	Difference between measured and filtered throttle position <= 119.50° TPS Actuator compaged manded off Actuator compaged manded manded off Actuator compaged manded manded off Actuator compaged manded ma	O.1 s Continuous AG. Volkswag	• 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3. Checking". page 1169
	Throttle Actuator Over Temperature	Electronic throttle valve driver temperature (hard-ware values) > 170.0 – 190.0 C	Actuator commanded on	• 0.1 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
	Throttle Actuator Short Circuit	Electronic throttle valve driver current commanded on (hardware values) > 9.3 – 15.0 A	• Actuator commanded on	• 0.1 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3-Refer to 3.6.34 Throttle Valve Control Module GX3, Checking", page 1169.
Throt-	Throttle Actuator Control System - Forced Limited Power	Internal check failed	Duty cycle > 80% or deviation throt- tle value angles vs. calculated value > 4 – 50%	• 0.5 to 5	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2122 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "D" Circuit Low	Accelerator Pedal Posi- tion Sensor 1 Out Of Range Low	Signal voltage sensor 1 < 0.39 V		• 0.3 s • Continuous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .
	Accelerator Pedal Posi- tion Sensor 1 Out Of Range High	Signal voltage sensor 1 > 4.86 V	ssauthorised by Volkswagen Ar	 0.3 s Continuous Nolkswagen, 	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 1101.
Throt- tle/	Accelerator Pedal Posi- tion Sensor 2 Out Of Range Low	• Signal voltage sensor 2 0.19 V 0.19		• 0.3 Sec. • Continuous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2- Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", on page 1101
Throt- tle/	Accelerator Pedal Posi- tion Sensor 2 Out Of Range High	• Signal voltage sensor 2 >	Professional Strategies of the	• 0.3 s • Continuous	• 2 DCY	- Check the % Accelerator Pedal Module - GX2. Refer to \$\infty\$ "3.6.1 Accelerator Pedal Module GX2. Checking".
Throt- tle/	Accelerator Pedal Posi- tion Sensor 1 and 2 Ra- tionality Check	Difference be- tween signal voltage sen- sor 1 and sen- sor 2 > 0.10 – 0.12 V	Protected by copy.	• 0.4 s • Continguous	• 2 DC Manufi	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	Mile Illumina- tion	Component Diagnostic Procedure
P2146 Fuel Injector Group "A" Supply Voltage Circuit/ Open	Fuel Injector Group "A" Supply Voltage Circuit/Open	 Signal current 2.6 Å Or Signal current Aumuino pad in the signal current Aumuino pad in the signal current Signal current Sign	80 RPM · Or	• 0.5 s	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 11:27.
P2149 Fuel Injec- tor Group "B" Sup- ply Volt- age Cir- cuit/ Open	Fuel Injector Group "B" Supply Voltage Circuit/Open	Signal current 2.6 A Oig Signal current > 14.90 A	 80 RPM Or Low side signal current > 2.70 A 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6:14 Fuel Injectors, Checking", page 1127

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Sys- tem	Fuel Sys- tem Too Lean @	• Adaptive value >= 28.0%	Air mass > 60.0 mg/stkECT @ cylinder	• 5.0 s • Continuous	• 2 DCY	 Check vac- uum lines visually for
Too Lean Off	Part Load		block > 60° C	. uous		leaks. - Check the in
Idle Bank 1			-48° C			take system visually for leaks (false
			• Lambda set point 0.92 – 1.05 [-]			air).
			Lambda control closed loop			fuel pressur and delivery quantity. Re
	solised by V	_{olksw} agen AG. Volkswa	 IAT @ manifold > -48° C AAT > -48° C Lambda set point 0.92 - 1.05 [-] Lambda control closed loop Integrated air mass > 5.0 - 200.0 g Mass fuel flow 17.99 - 51.02 mg/stk Engine speed 1,280 - 4,000 RPM And Evap purge valve closed Or Canister load <= 1.20 [-] Evap purge flow at max. value Or Dependence on canister purge 			fer to fuel system me- chanical tes ing in
, Kedus	less author		 Mass fuel flow operations 17.99 – 51.02 mg/ stk 	Cept any		⇒ "3.1 Pre- liminary Check", page 13 and
IS not berm			• Engine speed 1,280 – 4,000 RPM	centany liability with respect to me		or to appro- priate repai manual.
			AndEvap purge valve	espectt		Check the Fuel Injec-
			closed Or	Other		tors . Refer ⇒ "3.6.14 Fuel Injec-
			• Canister load <= 1.20 [-]			tors , Check ing", page 1127
			Evap purge flow at max. value	of inform.		Check the Oxygen Se
mos to arenito to t			Dependence on canister purge min:	wiess of information in this country,		sor 1 Before Catalytic Converter - GX10 Re
TO TO TO	Ellifolo TUBLIAdos A	Profected	• Lower limit of lambda controller output n.a. Or Upper limit of lambda controller output n.a.	Mathor		fer to ⇒ "3.6.26 Oxygen Se sor 1 Before Catalytic Converter GX10, Checking", page 1152
			And Evap purge flow at min. value			- Check the Fuel Delive Unit - GX1- Fuel Pump Control Moule - J538-
						Refer to ⇒ "3.6.13 Fuel Delive Unit GX1 / Fuel Pump Control Moule J538,

- Check the take Manifold Senso GX9 Ref to ⇒ "3.6.20 take Manifold Senso GX9, Check the ing", page 1139 - Check the Fuel Pressure Regulating Valve N276 Ref to ⇒ "3.6.15 Fuel Pressure Pressure Regulating Pressure Regulating Valve N276 Ref to	scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
take Manifold Senso GX9 Ref to ⇒ "3.6.20 take Manifold Senso GX9, Chec ing", page 1139 - Check the Fuel Pressure Regulating Valve N276 Ref to ⇒ "3.6.15 Fuel Pressure Regulations Fuel Pressure Regulations Fuel Pressure Regulations							<u>page 1125</u> .
to ⇒ "3.6.20 take Manifold Senso GX9, Checking", page 1139 - Check the Fuel Pressure Regulating Valve N276 Ret to ⇒ "3.6.15 Fuel Pressure Regulating Pressure Regulating Pressure Regulating Pressure Regulating Pressure Regulating Pressure Regulation Pressure Regu							take Mani- fold Sensor - GX9 Refer
GX9, Cheding", page 1139 - Check the Fuel Pressure Regulating Valve N276 Re to ⇒ "3.6.15 Fuel Pressure Regulation							to ⇒ "3.6.20 In- <u>take Mani-</u>
- Check the Fuel Pressure Regulating Valve N276 Re to ⇒ "3.6.15 Fuel Pressure Regulating Pressure Regulation Fuel Pres							GX9, Check-ing",
lating Valve N276 Re to ⇒ "3.6.15 Fuel Pres-							Check the Fuel Pres-
⇒ "3.6.15 Fuel Pres-							lating Valve - N276 Refer
AG. Volkswage n AG does not guarantee oracle in the season of the season							Fuel Pres-
ourposes, in part or in whole, is not the standard of the stan				Volkswagen	AG. Volkswage	nAG _{does not}	N276, Checking", page 1129
ourposes, in part or in whole, is not beam,				ndess authoriss			Thee Or accept
ourposes, in part or in whole			is not bern				ABD HIM WHITT
ourposes, in part			or in whole				espection
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Sys- tem Too Rich @ Part Load	• Adaptive value <= 25.0%	 Air mass > 60.0 mg/stk ECT @ cylinder block > 60° C IAT @ manifold > -48° C AAT > -48° C 	5.0 sContinuous	• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Pre-
'			 Lambda set point 0.92 – 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 – 			liminary Check", page 13 and/ or to appro- priate repair manual. - Check the
			200.0 g • Mass fuel flow 17.99 – 51.02 mg/ stk • Engine speed vol 1,280 4,000 RPM	kswagen AG do	98 not gu	Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 .
		in part or in whole, is hot bemitting the property of the prop	 Mass fuel flow 17.99 – 51.02 mg/stk Engine speed vol 1,280 – 4,000 And Evap purge valve closed Or Canister load <= 		osarantee orac	⇒ "3 ,6.26
		es, in part orin whole, is	 1.20 [-] Evap purge flow at max. value Or Dependence on canister purge 			Oxygen Sensor 1 Before Catalytic Converter GX10, 5 Checking", page 1152
		Copyrio or commercial purposes, in par	 Lower limit of lambda controller output n.a. Or Upper limit of 			- Check the Fuel Delivery Unit - GX1- / Fuel Rump Control Module - 3538 Refer to
		THE TOP BUILDING	lambda controller output n.a. And Eyap purge flow at min yalue	-DA 1190s	weako y ya ka	Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125
						 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	agnostic Proce- dure
	and the seath of t	ijsed by Volkswagen AG.	Volkswagen AG does not gu	rantee or accept and	lability)	GX9, Checking", page 1139. - Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
nt orin whole is	W.C.				with respect to the	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cooling System Performanc e	Engine Cooling System Cooling System Cooling System Performance Not In The Expected Range	• Cooling system temperature too low < 61 – 76° C	 < 42 – 57° C Min. AAT > -10° C At time of fault decision: Ratio fuel cut off <= 10.2% Ratio maximum vehicle speed <= 14.8% For vehicle speed > 120 km/h Ratio start-stop time <= 16.0% Ratio engine load time <= 39.8% For air mass flow ratio with max air mass flow < 2.5% And For air mass flow ratio with max air mass flow < 2.5% And 		and in the spect to	- Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117. - Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119. - Check the After-Run Coolant Pump - V51 Refer to ⇒ "3.6.2 After-Run Coolant Pump V51, Checking", page 1103. - Check the engine coolant thermostat. Refer to appropriate repair manual.
	in the lot of commercial purposes, in the lot plants of commercial purposes.	Toby Hallado Agpapago		io Maylalifado Di	the correctness of information in this cool, the correctness of information in this cool, the correctness of information in this cool, the correctness of information in the cor	nosis and Testing

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
En- gine	Engine Coolant Tempera- ture Sensor @ Radiator Outlet Cross Check	Diff. ROT vs. IAT @ first engine start > 20 K (depending on engine off time) And Diff. ROT vs. AAT @ first engine start > 20 K (depending on engine off time) And Diff. AAT vs. IAT @ first engine start < 20 K (depending on engine off time) And Diff. AAT vs. IAT @ first engine start < 20 K (depending on engine off time)	 Engine off time > 360.0 m Decrement check to ensure an cold vehicle state: Diff. IAT vs. min. IAT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s Diff. ROT vs. min. ROT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s Diff. AAT vs. min. AAT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s For time > 20.0 s 	• 100.0 s • Once / DCY	• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Cool- ant Temper- ature Sensor On Radiator Outlet G83 , Checking", page 1119 .
En- gine Cool- ant Tem- pera-	Engine Coolant Temperature Sensor @ Radiator Outlet Short To Ground	• Sensor volt- age < 0.30 V	. DA no genosylo V valnejívog	O.5 s Continuous Normation in this case of the continuous and the case of the continuous and the case of the case	et to the correctnes	- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 - Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 , Checking", page 1119 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
En- gine Cool- ant Tem-	Engine Coolant Tempera- ture Sensor @ Radiator Outlet Short To Battery / Open Cir- cuit		• IAT @ throttle >= -33° C • Time after engine start > 60.0 s an AG. Volkswagen AG does	• Contin- uous	• 2 DCY	- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83- Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 Checking", page 1119 . - Check the Engine Coolant Temperature Sensor - G62- Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62 Checking", page 1117 .
	ommercial polynage of commercial polynage of	Elyndoo iyo jiyo oo na papaan	DA Nagen Act	SMOV KOMB Y GO.	f information in this County	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illumina Time Length	Component Diagnostic Procedure
P2187 Sys- tem Too	Fuel Sys- tem Too Lean @ Idle	Case 1:Adaptive value >= 2.40 mg/stk	 Air mass > 60.0 mg/stk ECT @ cylinder block > 60° C 	• 5.0 s • Continuous	Check the vacuum lines visually for leaks.
at Idle	and a condition	Case 2:Adaptive value >= n.a. kg/	 IAT @ manifold > -48° C AAT > -48° C Lambda set point 	e correctness of,	Check the intake system visually for leaks (false air).
	or commercial		 Lambda set point 0.92 – 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 – 	information in this ob.	Check the fuel pressure and delivery quantity. Refer to fuel system me-
	*tojenka	Protected by copyright	 Vehicle speed < 6 km/h Driver request should low dynamics 	• 5.0 s • Continuous • Continuous • Continuous • Continuous	chanical test- ing in ⇒ "3.1 Pre- liminary Check", page 13 and/ or to appro-
			AndMass fuel flow lower range n.a.		priate repair manual. - Check the
			 Mass fuel flow upper range < 0.0 – 17.0 mg/stk 		Fuel Pres- sure Sensor - G247 Re- fer to
			Engine speed 704 – 992 RPMOr		⇒ "3.6.16 Fuel Pres- sure Sensor G247,
			• Engine n.a.		Checking", page 1131
			AndEvap purge valve closed		- Check the Fuel Injec- tors . Refer to
			 Or Canister load <= 1.20 [-] 		⇒ "3.6.14 Fuel Injectors, Checking",
			Evap purge flow at max. value		- Check the Oxygen Sen-
			 Or Depending on canister purge min: 		sor 1 Before Catalytic Converter - GX10 Re- fer to
			Lower limit of lambda controller output n.a.		⇒ "3.6.26 Oxygen Sen- sor 1 Before Catalytic
			 Or Upper limit of lambda controller output n.a. 		Converter GX10 , Checking", page 1152 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Cooling to the commercial purposes, in part or in whole, is not being the part of in whole in which the part of in whole in which the part of in whole in which the part of in which the part of in whole in which the part of in which the part	• And • Evap purge flow at min. value	swagen AG doe	Res not guarantee or ac	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538- Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 Testing", page 1125 . - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 Checking", page 1139 . - Check the Fuel Pressure Regulating Valve - N276- Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129 .
			-40-91019	. ĐA nəpe		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
De- scrip-	Strategy Description	Case 1: Adaptive value <= -2.40 mg/stk Case 2: Adaptive value <= n.a. kg/ h	 ters with Enable Conditions Air mass > 60.0 mg/stk ECT @ cylinder block > 60° C IAT @ manifold > -48° C AAT > -48° C Lambda set point 0.92 - 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 - 200.0 g Vehicle speed < 6 km/h Driver request low dynamics And Mass fuel flow lower range n.a. Mass fuel flow upper range < 0.00 - 17.0 mg/stk Engine speed 704 - 992 RPM 	Time Length • 5.0 s • Continuous G. Volkswagen	• 2 DCY AG does not guara	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. - Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Check ing". page 1127 - Check the Oxygen Sensor 1 Before Catalytic Converter GX10 - Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10.
			 Or Engine n.a. And Evap purge valve closed Or Canister load <= 1.20 [-] Evap purge flow at max. value Or Depending on canister purge min: Lower limit of lambda controller output n.a. Or Upper limit of lambda controller output n.a. 	G.	MAN A OIKEMEDELLA	Checking", page 1152. Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125. Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Colinate of commercial purposes, in part or in whole, is not pormitted.	• And • Evap purge flow at min. value	-ĐA nagawa	No V Kashiringoo jiran	GX9, Checking", page 1139. - Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Di- agnostic Proce- dure																			
P2195 O2	Oxygen Sensors	• Lambda value	O2S front ready	• 72.0 s	• 2 DCY	- Check the																			
Sen-	Front Ra-	ont Ra- onality • And	 O2S rear ready 	• Contin-		Oxygen Sen- sor 1 Before																			
sor Signal Biase	hal Check . C		• O2S signal rear >= 0.88 V • MAF > 15.0; < 300.0 kg/h • C1 @ cylinder block >= -48° C	 O2S signal 	O2S signal	 O2S signal 	O2S signal	O2S signal	O2S signal	O2S signal	O2S signal	O2S signal	 O2S signal 		uous		Catalytic Converter - GX10 Re-								
d/ Stuck Lean																									
Bank 1 Sen-		 Catalyst purge not active 			sor 1 Before Catalytic																				
sor 1		 Integrated MAF after end of cata- lyst purge 0 [-] 			Converter GX10 , Checking", page 1152 .																				
			• Engine speed > 1,152 RPM			Check the Fuel Delivery																			
			• EGT @ O2S front > -273; < 800° C			Unit - GX1- / Fuel Pump																			
			 Combustion mode change not active 			Control Mod- ule - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump																			
			 Integrated MAF > 40.0 g 																						
			 Dynamic lambda controller output < 3.5% 			Control Mod- ule J538, Testing",																			
			 Dynamic MAF < 0.08 g/rev 			page 1125 . - Check the In-																			
							 Dynamic engine speed < 200 RPM And Case 1; 52 authorised D MAFO 05 - 0.75 															Dynamic engine speed < 200 RPM	Volkswagen AG	i.VolkswagenAG	take Mani- los fold Sensor - GX9- Refer
								GX9 _{5/2} . Refer to ⇒ "3.6.20 oln-																	
			• Case 1;5500			take Mani-																			
			• MAF 0.05 – 0.75 g/rev			fold Sensor GX9, Check- ing", page 1139.																			
			• Engine speed 576 – 4,512 RPM																						
			• Or Case 2:																						
		Catalyst efficien- cy diagnosis ac-																							
			tive and the state of commercial purposess			⇒ "3.6.20° oln- take Mani- fold Sensor GX9, Check- ing", page 1139																			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	agnostic Proce-
	oses, in part or;	And O2S signal front < 1.06 [-]	 Fuel cut off not active Engine running And Choice of: Fuel trim diagnosis failure detected Or O2S rear sensor plausibility failure detected And Choice of: Lambda adaptation value >= 0.12 [-] Or Lambda adaptation value <= -0.12 [-] 	• Continuous	* SUATANIES OF ALGEORY	A liability with respect to the correctness of information in this of
			Project	. DA napper.		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure		
P2196 O2	Oxygen Sensors Front Ra-	ensors ont Ra- O2S rear ready • Contin-	• 2 DCY	Check the Oxygen Sen-				
Sen-			 O2S rear ready 	· · · · · · · · · · · · · · · · · · ·	sor 1 Before			
sor Signal Biase	tionality Check	O2S signal	 ECT @ cylinder block >= -48° C 	uous		Catalytic Converter GX10 Re-		
d/ Stuck Rich		rear <= 0.25 v	rear <= 0.25 V	• MAF > 15.0; < 300.0 kg/h			fer to ⇒ "3.6.26 D Oxygen Sen-	
Bank 1 Sen-		cial pur	 Catalyst purge not active 			sor 1 Before Catalytic		
sor 1		rear <= 0.25 V	 Integrated MAF after end of cata- lyst purge 0 [-] 			Converter GX10, Checking", page \$152.		
		TENLIN TOPS	• Engine speed > 1,152 RPM			- Check the Fuel Delivery		
		, dive	EGT @ O2S front > -273; < 800° C		Migh	`` Init _ GX1_ /		
		 Combustion mode change not active 	.ĐAn	Might by Volkswage	Control Mod- ule - J538 Refer to ⇒ "3.6.13			
			 Integrated MAF > 40.0 g 	1		Fuel Delivery Unit GX1 / Fuel Pump		
			 Dynamic lambda controller output < 3.5% 			Control Mod- ule J538, Testing",		
			Dynamic MAF < 0.08 g/rev		page 1125 . - Check the In-			
			 Dynamic engine speed < 200 RPM 			take Mani- fold Sensor - GX9 Refer		
			• And			to		
		-	• Case 1:			<u>⇒ "3.6.20 In-</u> take Mani-		
			• MAF 0.05 – 0.75 g/rev			fold Sensor GX9, Check- ing",		
						• Engine speed 576 – 4,512 RPM		
			• Or			EVAP Canis-		
			• Case 2:			ter Purge Regulator		
			Catalyst efficien- cy diagnosis ac-			Valve 1 - N80 Refer to		
			tive			<u>⇒ "3.6.12</u> EVAP Canis-		
						ter Purge Regulator Valve 1 N80 ,		
						Checking", page 1123		

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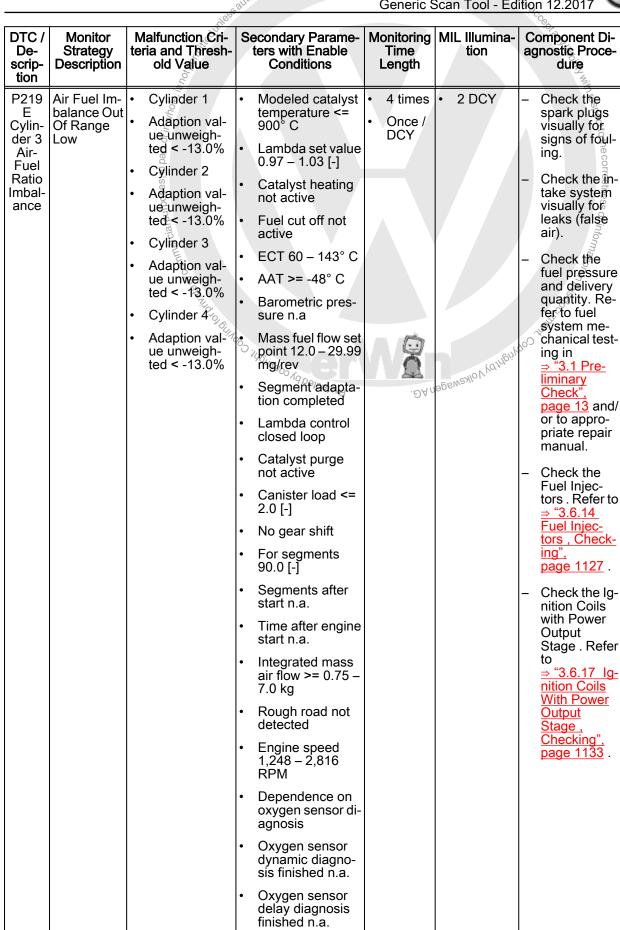
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	commercial purposes, in part or in whole, is horbon,	Lambda set value 1.00 [-] And O2S signal front > 0.89 [-]	 Fuel cut off not active Engine running And Choice of: Fuel trim diagnosis failure detected Or O2S rear sensor plausibility failure detected And Choice of: Lambda adaptation value >= 0.12 [-] Or Lambda adaptation value <= -0.12 [-] 	• 0.0 s • Continuous	Indition with respect to the correctness of information in this country, and the correctness of the correc	
P219 C Cylinder 1 Air- Fuel Ratio Imbal- ance	Air Fuel Imbalance Out Of Range Low	 Cylinder 1 	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] Catalyst heating not active Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure n.a Mass fuel flow set point 12.0 – 29.99 mg/rev Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift 	• 4 times • Once / DCY	• 2 DCY	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Check-tors igns with the spark plugs with the sp

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Cylinder 1	• For segments 90.0 [-]			<u>ing",</u> page 1127
		• Adaption val- ue weighted < -10.0%	Segments after start n.a.			Check the Ignition Coils
		Cylinder 2	Time after engine start n.a.			with Power Output Stage . Refer
		• Adaption val- ue weighted < -10.0%	• Integrated mass air flow >= 0.75 – 7.0 kg			to ⇒ "3.6.17 lg- <u>nition Coils</u>
		Cylinder 3Adaption value weighted 	Rough road not detected			With Power Output Stage , Checking",
		-10.0% • Cylinder 4	• Engine speed 1,248 – 2,816 RPM			<u>page 1133</u> .
		• Adaption value weighted < -10.0%	Dependence on oxygen sensor di- agnosis			decapter Historian with respect to the correct
			Oxygen sensor dynamic diagnor A sis finished n.a.	G. Volkswagen	AG does not guar	
		Š	Oxygen sensor delay diagnosis finished n.a.		4181	Nec Oracleor
			Diagnosis at gear			. and light
		not _{be}	1st gear not ac- tive			Oliji Wi
		in part or in whole, is not positilized.	2nd gear not active			in respect
		oart or i	3nd gear not active			to the co
		es, in	4nd gear active			orrect
		sodır	5nd gear active			ness
		cial pl	• 6nd gear active			of infc
		mmeri	7nd gear active			ⁿ rnati
		100,100	8nd gear not active			on in th
		Alordymate of commercial purposes, in pa	Limited dynamic conditions			John Och
			Dynamic engine speed < 75 RPM	9		my Copy
			Dynamic MAF < 29.99 mg/reve _{loug}	.b.	A NOIKENSGEN A	ne correctness of information in this cooking to the correctness of information in this cooking the correctness of the corr
			Dynamic torque request < 0.10 [-]			
			Dynamic window lambda control < 5.0%			
			Dynamic ignition angle < 0.10 [-]			

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DTC / De- scrip- tion	Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
part or in who,	or, is not be		 Additional conditions Misfire on currently lean shifted cylinder not detected 		ky with respect to the con	
P219 D S Cyling der 2 Air- Fuel	Air Fuel Imbalance Out Of Range Low	• Adaption value unweighted < -13.0%	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] Catalyst heating not active Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure ma Mass fuel flow set point 12.0 – 29.99 mg/rev Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start n.a. Time after engine start n.a. Integrated mass air flow >= 0.75 – 7.0 kg Rough road not detected Engine speed 1,248 – 2,816 RPM Dependence on 	• 4 times • Once / DCY	0 D@V	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors. Refer to ± "3.6.14 Fuel Injectors, Checking", page 1127. Check the Ignition Coils with Power Output Stage. Refer to ± "3.6.17 Ignition Coils With Power Output Stage. Checking", page 1133.
			oxygen sensor di- agnosis			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
scription	Description	Cylinder 1 Adaption value weighted < -10.0% Cylinder 2 Adaption value weighted < -10.0% Cylinder 3 Adaption value weighted < -10.0% Cylinder 4 Adaption value weighted < -10.0%	 Oxygen sensor dynamic diagnosis finished n.a. Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 2nd gear not active 3nd gear not active 4nd gear active 5nd gear active 6nd gear active 7nd gear active 8nd gear not active 7nd gear active Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/rev Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0% Dynamic ignition angle < 0.10 [-] 	_{kswagen} AG. V	olkswagen AG doe	S not guarantee or acceptals	Tippilly "This of
326	Rep. Gr.ST - G	eneric Scan Tool		.×.4	.DA		



Diagnosis at gear

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	or commercial purposes, in part or in whole, is not beaning.	Cylinder 1 Adaption value weighted < -10.0% Cylinder 2 Adaption value weighted < -10.0% Cylinder 3 Adaption value weighted < -10.0% Cylinder 4 Adaption value weighted < -10.0% Cylinder 4 Adaption value weighted < -10.0%	• 3nd gear not active • 3nd gear not active • 4nd gear active • 5nd gear active		accept am liability with respect to the co	
328	Rep. Gr.ST - G	eneric Scan Tool				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P219 F Cylin- der 4 Air- Fuel	Air Fuel Im- balance Out Of Range Low	ue unweigh- ted < -13.0%	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] 	4 times Once / DCY	• 2 DCY	Check the spark plugs visually for signs of foul- ing.
Ratio Imbal- ance		 Cylinder 2 Adaption value unweighted < -13.0% Cylinder 3 	Catalyst heating not activeFuel cut off not active			 Check the intake system visually for leaks (false air).
		 Adaption value unweighted < -13.0% Cylinder 4 	 ECT 60 – 143° C AAT >= -48° C Barometric pressure n.a 			Check the fuel pressure and delivery quantity. Refer to fuel
		Adaption val- ue unweigh- ted < -13.0%	 Mass fuel flow set point 12.0 – 29.99 mg/rev Segment adapta- tion completed 			system me- chanical test- ing in ⇒ "3.1 Pre- liminary Check",
			 Lambda control closed loop Catalyst purge 			page 13 and/ or to appro- priate repair
		wewsge	• Canister load <= 2.0 [-]			- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Check-
	Silie	sauthorised by Volne	For segments 90.0 [-]Segments after start n.a.	lot guarantee or ac		ing", page 1127. Check the Ignition Coils
	Ole, is not bernitt.		 Time after engine start n.a. Integrated mass air flow >= 0.75 - 		Wigplikywithrest	with Power Output Stage . Refer to ⇒ "3.6.17 lg- nition Coils
	ss, in part or in wr	anthorized by Volkewage	 Catalyst purge not active Canister load <= 2.0 [-] AGNO gear shift does / For segments 90.0 [-] Segments after start n.a. Time after engine start n.a. Integrated mass air flow >= 0.75 - 7.0 kg Rough road not detected Engine speed 1,248 - 2,816 RPM Dependence on oxygen sensor diagnosis Oxygen sensor dynamic diagnosis finished n.a. Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 		ect to the correct	With Power Output Stage , Checking", page 1133
	nmercial purposk		 RPM Dependence on oxygen sensor diagnosis 		iness of informat	
	moo to alient to to		 Oxygen sensor dynamic diagno- sis finished n.a. Oxygen sensor 		tion in this go	
	**************************************	TOO HOUNDONADDON	delay diagnosis finished n.a. Diagnosis at gear	MoVydhightoy,	\$ [®]	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			1st gear not active			
			 2nd gear not active 			
			3nd gear not active			
			4nd gear active			
			5nd gear active			
			6nd gear active			
			7nd gear active			
			8nd gear not active			
			Limited dynamic conditions			
		Any Volkswagen AG	No Dynamic engine speed < 75 RPM	4-		
	es auth	orised Ex	Dynamic MAF < 29.99 mg/rev	arantee Oran		
	itteduriles		 Dynamic torque request < 0.10 [-] 	Celor		
	s, isnotbern		Dynamic window lambda control < 5.0%		ability with re	
rinwhou			 Dynamic ignition angle < 0.10 [-] 		spectto	
n part o			 Additional conditions 		the corr	
cial purposes, i		Cylinder 1 Adaption value weighted < -10.0% Cylinder 2 Adaption value weighted < -10.40%	 Misfire on cur- rently lean shifted cylinder not de- tected 		Highlifty with respect to the correctness of information in this oc	
7	Julius Company	Cylinder 1			rmati	
	ate of col	Adaption val- ue weighted <			on in this	
	144-to.	-10.0%		, ir	8	
	* OUNADO	• Cylinder 2		John Co.		
	S S	ye weighted <	10kg	Carrilling of		
		• Cylinder 3	. ĐA nagenzy			
		Adaption val- ue weighted < -10.0%				
		Cylinder 4				
		Adaption value weighted < -10.0%				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2231 O2 Sen- sor Signal	O2 Sensor Signal Cir- cuit Shorted to Heater Circuit Bank 1 Sensor 1	Delta O2S signal front > 190 uA 190 uA Modeling State of Color of the Market of the Color	Engine speed < 2,700 RPM Engine load < 60% Heater duty cycle 20 – 80% Modeled exhaust gas temp < 800.1° C Lambda 0.95 – 1.05 [-] Heater control closed loop no fault			- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to \$\frac{1}{2}\$3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10 Checking". page 1152.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2237 O2 Sensor Positive Current Control Second Positive Current Consult Open Bank 1 Second Positive Current Control Circuit/ Open Bank 1 Second Positive Circuit/ Open Bank 1 Second Positive Circuit/ Open Bank 1 Second Positive Circuit/ Open Ba	Sensors Front Open Circuit Pump Volt- age (VIP)	 Choice of: Nernst voltage (VN) > 4.40 V Or Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground voltage (VG) < -2.35 V Or Diff. pomp voltage (VIP) vs. virtual ground voltage (VG) < -2.35 V 		Continuous C		- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10- Refers Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.

DTC / Monit De- scrip- tion Monit Strate Descrip	gy teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2243 Oxygen Sensors Front O Circuit Nernst	voltage (VIP) vs. virtual ground volt- age (VG) <= 1.20 V		Continuous	• 2 DCY anot guaranteeorace sylon Kalufundoo	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
O2 Sen- sor	Oxygen Sensors Front Open Circuit Vir- tual Ground (VG)	 Nernst voltage (VN) > 4.40 V Or Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground voltage (VG) < -2.35 V 	 O2S front (linear) ready Measurement of WRAF sensor label resistor finished Pump current controller active 	Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.	
		Or Diff. nernst voltage (VN) vs. virtual ground voltage (VG) > 1.60 V	ittle dunder stantonie ed by V	bikswagen A.G.	/olkswagen AG d _o	es not guarantes oracc	
		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) < -0.10 V	100, 15701,0977116 1011116				My liability with respe
		• Or • Pump current > 0.0115 A					cttomeco
		Or Measurement WRAF sensor label resistor > n.a. Ω	mercian				ness of informa
		• And	orcom				tionin
		Choice of: Diff. pump voltage (VIP) vs. virtual ground voltage (VG) <= 1.20 V	Semmo of Orland Orlando of Orland	7p322		WeAlo Vedinghydoo ingri	<i>y</i> .
		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) <= 1.20 V		_{dro} jo1 ^q	.ĐA nage	,.	
		• Or					

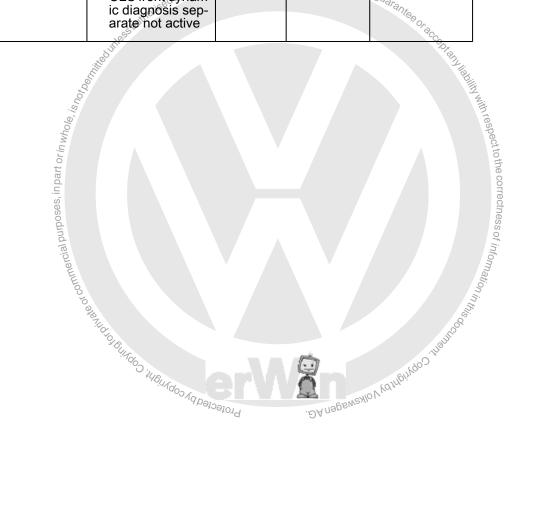
			13/100			100
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 1.20 V Diff. nernst voltage (VN) vs. virtual ground voltage (VG) > 1.20 V				
P2257 AIR Sys- tem Con- trol "A" Circuit Low	Secondary Air Injection Pump Re- lay Short To Ground	Output voltage (hard-ware values) < 1.85 – 2.28 V	Engine running Actuator commanded off	• 0.5 s • Continuous	• 2 DCY	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor V101 Refer Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.
P2258 AIR Sys- tem Con- trol "A" Circuit High	Secondary Air Injection Pump Re- lay Short To Battery Plus	 Actuator temperature > 155 - 185° C Or Output current (hardware values) > 1.0 - 2.0 A 	Engine running Actuator commanded on	• 0.5 s • Continuous	• 2 DCY	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.

	Generic Scan Tool - Edition 12.2017									
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure				
P2261 Tur- bo- charg- er/Su- per- charg- er By- pass Valve "A" - Me- chani- cal	Valve Func- tional	 Case 1: Integrated boost pressure > n.a. kPa*s Or Integrated boost pressure < n.a. kPa*s Case 2: Counter for boost pressure deviation > 5.0 [-] 	Activations conditions: Recirculation actuator position set point 100.0%	• 0.1 s • Continuous	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 Checking", page 1172 . - Check the Charge Air Pressure Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 . Checking", page 1113 .				
Tur- bo- charg-	Turbo- charger Boost Con- trol Position Sensor Functional Check	No adaption of boost pres- sure actuator sensor in ac- tual driving cy- cle (no previ- ous adapta- tion occurred)		• 0.0 s • Once / DCY	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 Checking", page 1172 - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 Checking", page 1113				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
O2 Sen- sor Signal Biase	Oxygen Sensors Rear Signal Range Check	Case 1:Max. O2S rear voltage < 0.87 VAnd	 General conditions Vehicle speed >= 10 km/h Barometric pres- 	• 86.5 s • Once / DCY	• 2 DCY	 Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer
d/ Stuck Lean Bank 1 Sen- sor 2		Oxygen load during Peak Max detection > 2.6 g	Catalyst over-heating protection not active			to ⇒ "3.6.25 Oxygen Sen- sor 1 After Catalytic Converter
55. 2		• Or	O2S rear ready			GX7, Check-
		• Case 2:	O2S front ready			<u>ing",</u> page 1149 .
		O2S front ready max. O2S rear volt-	O2S front pump current valid			
	ag Ar Ox du Mx > x Ar Cx ca	age < 0.87 V	O2S heater rear active			
		Oxygen load during Peak Max detection	 Integrated heat energy >= 1,600.0 - 3,000.0 kJ 			
		> 2.5 g	• Or			
		Counter in case of sus-	• Time after engine start > 230.0 – 1,000.0 s			
		pected Peak Max errorv>ge 5,000.0 [-]	• Engine speed AG 11,344 – 3,008 RPM ^f 9 _{U-272}			
\65 ^S	authoris		Lambda control value < 50.0%			
A HILLIAN CONTRACTOR OF THE PARTY OF THE PAR			Lambda control- ler deviation < 0.08 – 0.15 [-]	* Phylidolliti		
00			Quickpass trim control ready	Withres		
or com			 Proportional part of trim control < 0.25 [-] 	pect to the		
			Lambda adaption commanded off	correctn		
			Scavenging not active	ess of ir.		
		Y A	Valve lift not active	^{nformati} i		
STO REMINDE	iligirydos yd be		Time after a catalyst purge phase >= 0.02 s	ability with respect to the correctness of information in this doc		
J. O. L. L.	%3. ₁₁		Temperature conditions	S		
	46IJAGODALIGP	BIVI	• ECT > 60°C • JAT > -48° C			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
De- scrip- tion	Strategy Description	teria and Thresh-	 Modeled catalyst temp. 500 – 700° C Modeled catalyst temp. 500 – 730° C Modeled catalyst temp. extended range 470 – 730° C Integrated MAF catalyst temp. conditions fulfilled > n.a. g Difference between dynamic and stationary catalyst temp254.0 – 254.0 K Difference between dynamic and stationary catalyst temp254.0 – 304.0 K Modeled catalyst temperature @ start > 550° C Modeled exhaust gas temperature at O2S rear <= 0.1,201° C Air mass flow conditions 	Time Length	tion	agnostic Procedure
	mmercial purp		 MAF extended range n.a. mg/rev Limited dynamics conditions 		S of informatic	
	O to altanidable	Handoo ilus	 Dynamic engine speed < 20 RPM Dynamic lambda controller output <= 20.0% 	aukdo.	On in this cook of the state of	
		ofected by copyright	• Dynamic MAF < 25.01 mg/stk	SMO V VOING THE DAY OF		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Integrated MAF after dynamic conditions are ful- filled > 20.0 g			
			 Evap purge conditions 			
			• Canister load <= 2.0 [-]			
			• Or			
			 Evap purge valve closed 			
			Close the gap conditions			
			 O2S rear voltage @ diagnosis start >= 0.55 			
			Integrated MAF to start diagnosis n.a.	_{agen} AG. Volks	wagen AG doc	
			 Integrated MAF to start diagnosis n.a. O2S front dynamic diagnosis separate not active 		ases no	t guarantee or acc



DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure	
P2271 Oxygen Sensors Rear Signal Range Check Rich Bank 1 Sensor 2	Case 1: Max. O2S rear voltage > 0.25 V And Oxygen load during Peak Max detection > 2.6 g Or Case 2: O2S front ready max. O2S rear voltage > 0.25 V And Oxygen load during Peak Max detection > 2.5 g And Counter in case of suspected Peak Max error > 5,000.0 [-]	tion not active O2S rear ready O2S front ready O2S front pump current valid O2S heater rear active Integrated heat energy >= 1,600.0 - 3,000.0 kJ Or Time after engine start > 230.0 - 1,000.0 sec. Engine speed 1,344 - 3,008	_{ejo} gio19	kswagen AG does	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7 , Checking". **ROTATION TO PAGE 1149 . **ROTATION	indoinity with respect to the control of the contro

	1		es auti			Ora
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		inge of commercial purposes, in part or in whole, is no	 Modeled catalyst temp. 500 – 700° C Modeled catalyst temp. extended range 470 – 730° C 			A HELINGO HELI
		ercial purposes	 Integrated MAF catalyst temp. conditions fulfil- led > n.a. g 			to much
		muse of comm	-234.0 - 234.0 K			iation in this object.
			Difference be- tween dynamic and stationary catalyst temp. ex- tended range -304.0 – 304.0 K	rW I	y Volkewagen AG.	Thrughton the
			 Modeled catalyst temperature @ start > 550° C 			
			 Modeled exhaust gas temperature at O2S rear <= 1,201° C 			
			Air mass flow conditions			
			 MAF per cylinder 40.0 – 130.0 kg/h 			
			 MAF per cylinder extended range 35.0 – 135.0 kg/h 			
			 MAF 125.01 – 580.0 mg/rev 			
			 MAF set point 125.0 – 580.0 mg/ rev 			
			MAF extended range n.a. mg/rev			
			Limited dynamics conditions			
			 Dynamic engine speed < 20 RPM 			
			Dynamic lambda controller output <= 20.0%			
			 Dynamic MAF < 25.01 mg/stk 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Integrated MAF after dynamic conditions are ful- filled > 20.0 g			
			 Evap purge con- ditions 			
			 Canister load <= 2.0 [-] 			
			• Or			
			Evap purge valve closed			
			Close the gap conditions			
		- gen	O2S rear voltage @ diagnosis start G. √∂₹:0.550, AG.			
	a	uthorised by Volkswago.	 @ diagnosis start G. √∂∓ 0.55 n_{AG do} Integrated MAF not to start diagnosis n.a. O2S front dynamic diagnosis n.a. 	9Uarantee Or		
		uthorised by Volkswagen	O2S front dynamic diagnosis separate not active	* *CCX	Reny lieb	
O2 Sen- sor	Signal Biased/ Stuck Lean	age of <= 0.70	Mass all flow 25 –150 kg/hO2S rear readi-	• 215.0 s	• 2 DCY	 Check the Oxygen Sensor 1 After Catalytic
Biase d/	Bank 1 Sensor 3	O2S rear sig- nal not oscil- lating at refer- ence < 0.62 –	ness > 30.0 s • Modeled exhaust gas temp > 350°		nrespect to the correctness	Converter - GX7 Refer to
Stuck Lean		0.65 V	C		rectn	<u>⇒ "3.6.25</u> Oxygen Sen-
Bank 1 Sen- sor 3	cial purpos	Enrichment after stuck lean 27.9%	2nd lambda con- trol closed loop		ess of information	sor 1 After Catalytic Converter GX7, Check-
	Jumme				matio	ing", page 1149
	Sto Steam to Still Co	• Enrichment after stuck lean 27.9%	Olkswagen AG.	Warldingo ing	in the Co	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
O2 Sen- sor	O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sen- sor 3	 O2S sensor voltage >= 0.15 V After oxygen mass flow (fuel cutoff) > 4,500 mg Number of checks >= 1 	 Time of fuel cutoff <= 90.0 s Time after last fuel cutoff >= 20.0 s O2S rear ready Exhaust temp at sensor >= 385° C Exhaust mass flow > 12 kg/h Exhaust mass flow dynamic within range -80 - 80 kg/h Sensor voltage at start of measurement > 0.45 V 	• 10.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
Intake Air Sys- tem Leak	Intake Air System Rationality Check	Ratio adapted turbocharger boost pressure and actual turbocharger boost pressure > 30.0% Lambda correction included controller and adaption -50.0 – 50.0% Lambda controller active	 Intake manifold modeled adaption active (by turbocharger boost pressure) Throttle position > 4.50° TPS Engine speed 1,216 – 6,000 RPM Pressure quotient @ throttle 0.63 – 0.90 [-] Engine running Fast throttle adaptation finished MAP gradient -200.0 kPa/s Fuel cut off not active Time after engine start > 5.0 s Boost pressure < 135.0 kPa BARO 73.0 - 107.5 kPa BARO 73.0 - 107.5 kPa 	olity with respect to the correctness of information in this	• 2 DCY	 Check for air leaks near the throttle body, oil fill cap not tight or oil dipstick not seated in tube. Also check for any engine gaskets that can cause additional air to enter the crankcase can set this fault as the PCV system is not metered. If a vacuum leak or crankcase seal is the cause, the idle may be rough or unstable. Check the Intake Manifold Sensor - GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking". page 1139 Check the Throttle Valve Con-

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
	Whole, is not commercial purposes; in part or in whole, is not be	Throttle cross-sectional area correction included controller and adaption > 50.0% Lambda correction included controller and adaption −28.0 − 28.0% Lambda controller and adaption −28.0 − 28.0% Lambda controller active	 Intake manifold modeled adaption active (by throttle opening area) Throttle position 0.000 – 100.003° TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] Fast throttle adaptation finished MAP gradient -200.0 = 200.0 kPa/sec Fuel cut off not active Time after engine start > 5.0 s Boost pressure 73.0 – 107.5 kPa BARO 73.0 – 107.5 kPa 	Manufundo jus	Midwhith respect to the correctness of information in this cooking	trol Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169 . - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 .
P2293 Fuel Pres- sure Regu- lator 2 Per- for- manc e	Fuel Pressure Regulator 2 Performance	Difference between target pressure vs actual pressure: > 1.50 MPa Or <-1.50 MPa	 Time after engine start 10.0 s Fuel cutoff not active 	• 3.0 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
	Fuel Pressure Regulator 1 Control Circuit/	 Signal voltage 1.40 – 3.20 V Or Signal pattern incorrect 	 Fuel control valve commanded off Fuel pump commanded on 	• 0.5 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 , Checking", page 1129 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2295 Fuel Pressure Regulator 2 Control Circuit Low	Fuel Pres- sure Regu- lator 2 Con- trol Circuit Low	• Signal voltage 1.40 – 3.20 V	Fuel control valve commanded off	• 0.5 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 . Checking", page 1129 .
	Fuel Pres- sure Regu- lator 2 Con- trol Circuit High	• Signal voltage > 3.20 V	Fuel control valve commanded on Output Discontinuous comman		• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
P2300 Ignition Coil "A" Primary Control Circuit Low		• Qutput current in ON state > 50.0 – 100.0 mA (hardware values)		0.8 sContinuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2301 Igni- tion Coil "A" Pri- mary Con- trol Circuit High	Ignition Coils Short To Battery Plus	Output voltage in OFF state > 4.95 – 5.285 V (hardware values) Output temperature from ATIC in ON state > 160.0 – 200.0° C Output current in ON state > 100.0 – 180.0 mA (hardware values)	 Engine speed > 512 RPM Engine stop not active Actuator commanded off Engine speed > 512 RPM Engine stop not active Actuator commanded on 	• 0.8 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2302 Igni- tion Coil "A" Sec- on- dary Circuit	Ignition Coils Open Circuit	 Output voltage in OFF state lower range >= 1.92 - 2.21 V Output voltage in OFF state upper range <= 2.85 - 3.25 V (hardware values) 	 Engine speed > 512 RPM ECT @ cylinder block > -30° C Engine stop not active 	0.8 s Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2303 Igni- tion Coil "B" Pri- mary Con- trol Circuit Low	Ignition Coils Short To Ground	Output current in ON state > 50.0 - 100.0 mA (hardware values) Output current in ON state > 50.0 - 100.0 mA (hardware values)	 Engine speed > 512 RRM ECT @ cylinder block > -30° C Engine stop not active 	● Continuous	• 2 DCY does not guarantee	- Check the Ignition Coils with Power Output Stage . Refer to ≤ "3.6.17 Ignition Coils With Power Output Stage Checking", page 1133 .
P2304 Ignition Coil "B" Primary Control Circuit High	Ignition Coils Short To Battery Plus	Output voitage in OFF state > 4.95 – 5.285 V (hardware values) Output temperature from ATIC in ON state > 160.0 – 200.0° C	 Engine speed > 512 RPM Engine stop not active Actuator commanded off Engine speed > 512 RPM Engine stop not active 	• 0.8 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17° Ignition Coils With Power Output Stage Checking",
P2305 Igni- tion Coil "B" Sec- on- dary Circuit	Ignition Coils Open Circuit	 Output voltage in OFF state lower range >= 1.92 - 2.21 V Output voltage in OFF state upper range <= 2.85 - 3.25 V (hardware values) 	 Engine speed > 512 RPM ECT @ cylinder block > -30° C Engine stop not active 	0.8 s Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2306 Ignition Coil "C" Primary Control Circuit Low	Ignition Coils Short To Ground	Output current in ON state > 500 – 100.0 mA (hardware values)	 Engine speed > 512 RPM ECT @ cylinder block > -30° C Engine stop not active 	• 0.8 s • Contin-V KSW uous	• 2 DCY plkswagen AG doe	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2307 Igni- tion Coil "C" Pri- mary Con- trol Circuit High	Ignition Coils Short To Battery Plus	Output voltage in OFF state > 4.95 b 5.285 V (hardware values) Output temperature from ATIC in ON state > 160.0 - 200.0° C Or Output current in ON state > 100.0 - 180.0 mA (hardware values)	 Engine speed > 512 RPM Engine stop not active Actuator commanded off Engine speed > 512 RPM Engine stop not active Actuator commanded on Engine speed > 	• 0.8 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 .
P2308 Igni- tion Coil "C" Sec- on- dary Circuit	Ignition Coils Open Circuit	Output voltage in OFF state lower range >= 1.92 - 2.21 V Output voltage in OFF state upper range <= 2.85 - 3.25 V (hardware values)	 Engine speed > 512 RPM ECT @ cylinder block > -30° C Engine stop not active 	0.8 s Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2309 Ignition Coil "D" Primary Control Circuit Low	Ignition Coils Short To Ground	Output current in ON state > 50.0 – 100.0 mA (hardware values)	 Engine speed > 512 RPM ECT @ cylinder block > -30° C Engine stop not active 	0.8 sContinuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .

Description										
Ignition Coils Short Sate > 4,95 - 5,285 V (hardware values)	De- scrip-	Strategy	teria and Thresh-	ters with Enable	Time		agnostic Proce-			
P2311 Ignition Coils Open Circuit Circuit Circuit Circuit Continue Cont	Igni- tion Coil "D" Pri- mary Con-	Coils Short To Battery	age in OFF state > 4.95 – 5.285 V (hard-	512 RPMEngine stop not activeActuator com-	Contin-	• 2 DCY	nition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils			
P2311 Ignition Coils Open Circuit "D" Secondary Circuit Circuit P2400 Leak Detection Pump Sysyopen Dump Control Coil Corcuit Control Coil Copen Control Coil Copen Corcuit Corcuit P2400 Leak Detection Pump Control Coil Corcuit Coil Copen Control Coil Copen Control Coil Corcuit P2400 Leak Detection Pump Control Coil Corcuit Corcuit Corcuit P2400 Control Corcuit	Circuit		perature from ATIC in ON state > 160.0 – 200.0° C	51Ž RPMEngine stop not active			Output Stage , Checking",			
Ignition Coils Open Circuit			Output current in ON state > 100.0 – 180.0 mA (hardware)							
on-dary Circuit • Output voltage in OFF state upper range <= 2.85 - 3.25 V (hardware values) P2400 Leak Detection Pump Open Circuit Leak Detection Pump Control Circuit Circuit/ Circuit/ • Output voltactive • Actuator commanded off • Actuator commanded off • Continuous • Check the Leak Detection Pump V144 . Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Refer to page 1.143 .	Igni- tion Coil "D"	Coils Open	age in OFF state lower range >= 1.92 – 2.21 V	512 RPM • ECT @ cylinder block > -30° C	Contin-	• 2 DCY	nition Coils with Power Output Stage . Refer			
P2400 Leak Detection Pump Open Circuit ware values) Leak Detection Pump Open Circuit ware values Leak Detection Pump Control Circuit / Ci	dary		age in OFF state upper	active	es not guara		nition Coils With Power Output Stage, Checking", page 1133.			
P2401 Leak Detection Pump System Leak Detection Pump Control Circuit Low P2401 Leak Detection Pump System Leak Detection Pump Control Circuit Low P2401 Leak Detection Pump System Actuator commanded off • Actuator commanded off • Continuous • Continuous • Continuous • 2 DCY • Continuous • 3.6.22 Leak Detection Pump V144. Checking", page 1143.	EVAP Sys- tem Leak De- tec- tion Pump Con- trol Cir- cuit/ Open	tion Pump Open Cir- cuit	Qutput voltage 1.85 – 2.28 V (hardware values)	Actuator commanded off	• 2.0 s	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.			
Low individual state of the sta	EVAP Sys- tem Leak De- tec- tion Pump Con- trol	Leak Detec- tion Pump Short To	• Output volt- age < 1.85 – 2.28 V (hard-	Actuator commanded off	• 2.0 s • Continuous	2 DCY 2 DCY 3 DCY 4 DCY 4 DCY 5 Information in this operation in this operation in the control of the control o	- Check the Leak Detection Pump - V144- Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.			
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	Monitor Strategy escription	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Actuator temperature > 155 - 185° C Or Output current > 1.0 - 3.0 A (hardware values) 	Actuator com- manded on	2.0 sContinuous	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
tem Leak De- Leak De- tec- tion Pump Sense Cir- cuit/ Open	m Leak etection imp ense Cir- it/Open		 Time after engine start 5.0 – 65,530.0 s ECT 5 – 120° C ECT at start 5 – 50° C Engine off time > 21,600.0 s Altitude < 2,700 m Integrated purge flow > 12 g Restart temp diff > 0 K Veh speed >= 0 km/h s not yellow > 30 km/h Any drive gear EVAP purge valve ready no faults LDP commanded off 	Once / DCY Reception Highling Milling Reception Highling R	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144., Checking"., page 1143.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2404 EVAP System Leak Detection Pump Sense Circuit Rang e/Performanc e	EVAP System Leak Detection Pump Sense Circuit Range/ Performance	 High signal voltage > 12.0 s Number of checks = 30 	 Time after engine start 12.0 – 65,530.0 s Engine off time > 21,600.0 s ECT 5 – 120° C ECT at start 5 – 50° C Ambient air temp 5 – 59° C Altitude < 2,700 m Intake manifold vacuum > -2,560 hPa Restart temp diff > 0 K Veh speed >= 0 km/h Veh speed ones > 30 km/h Any drive gear EVAP purge valve ready no faults LDP commanded 	143.0 s • Once / DCY	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144., Checking", page 1143.
	EVAP System Signal Check	Pump current oscillation 1.5 mA Number of aborted leak measure ments due to pump current oscillations > 0.0 [-]	Time after measurement start > 4.0 s (during ECM keep alivetime)	• 624.0 s • Once / DCY	• 2 DCY	- Check the Leak Detection Pump - V144 - Refer to ⇒ "3.6.22 Leak Detection Pump V144 , Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P240 A EVAP Sys- tem Leak De- tec- tion Pump Heat- er Con- trol Cir- cuit/ Open	EVAP Leak Detection Pump Heat- er Open Cir- cuit	 Output voltage lower range 1.85 – 2.28 V Output voltage upper range 2.75 – 3.36 V (hardware values) 	Actuator com- manded off	• 0.3 s • Continuous	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 , Checking", page 1143 .
P240 B EVAP System Leak Detection Pump Heater Control Circuit Low	EVAP Leak Detection Pump Heat- er Short To Ground	age < 1.85 –	Actuator commanded off Manual Commande	0.3 s Continuous AG. Volkswage	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .
P240 C EVAP Sys- tem Leak De- tec- tion Pump Heat- er Con- trol Circuit High	EVAP Leak Detection Pump Heat- er Short To Battery Plus	Actuator temperature > 155 Pali 185° C Or Output current > 1.0 3.0 A (hardware values)	Actuator com- manded on	• 0.3 s • Continuous	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2414 O2 Sen- sor Ex- haust Sam- ple Er- ror Bank 1 Sen- sor 1	Sensors Front Ra- tionality Check	Pump current correction > 1.2 mA (nernst-cell) Difference be-	Fuel cut off not activeCylinder shut off not active	• 10.0 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 .
P2431 AIR Sys- tem Air Flow/ Pres- sure Sen- sor Circuit Rang e/Per- for- manc e Bank 1	Air System Pressure Sensor Rationality Check	Difference between AIR pressure and barometric pressure > 6.0 kPa And Difference between AIR pressure and intake manifold pressure > 6.0 kPa And	• For time n.a.	• 0.1 s • Multi-ple	· 2 DCY	- Check the Secondary Air System - GX24 Re- fer to 3.6.32 Secondary Air System GX24

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DTC / De- scrip- tion	Strategy	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2432 AIR System Air Flow/ Pressor Circuit Low Bank 1	Secondary Air System Pressure Sensor Out Of Range Low		Protected by cop	• 0.1 s • Continuous	· 2 DCY	- Check the Secondary Air System - GX24 - Refer to ⇒ "3.6.32 Secondary Air System GX24 , Checking", page 1165 . - For Beetle, check the Secondary Air Injection Sensor 2 - G610 - Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610 , Checking", page 1161 .
P2433 AIR Sys- tem Air Flow/ Pres- sure Sen- sor Circuit High Bank 1		• Sensor voltage > 4.50 V		• 0.1 s • Continuous	• 2 DCY	- Check the Secondary Air System - GX24 - Refer to ⇒ "3.6.32 Secondary Air System GX24 - Checking", page 1165 . - For Beetle, check the Secondary Air Injection Sensor 2 - G610 - Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610 - Checking", page 1161 .

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2440 AIR System Switc hing Valve Stuck Open Bank 1	Secondary Air Valve Functional Check	• Ratio relative pressure phase 1 and relative pressure phase 2 > 1.50 [-]	 General: Secondary air pump ready Catalyst heating active Secondary air injection active MAF 140.0 kg/h ECT @ cylinder block >= -10; < 115° C IAT @ manifold >= -10; < 100° C Modeled catalyst temperature < 700° C Relative barometric pressure > 0.73 [-] And Diff. barometric pressure vs. manifold pressure vs. manifold pressure > n.a. kPa Or Engine n.a. 	• Once In respective DCY	• 2 DCY	 Check the Secondary Air Injection Solenoid Valve - N112 - Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112 - Checking", page 1163 Check the Secondary Air Injection Pump Relay - J299 - / Secondary Air Injection Pump Motor - V101 - Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101 - Checking", page 1157
P2450 EVAP Sys- tem Switc hing Valve Per- for- manc e/ Stuck Open	EVAP System Rationality Check	 Time after measurement start > 2.0; < 2.5 s And Drop of evap pump current < 3.0 mA 	 Barometric pressure > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start <= 20.3 K Engine stop (during ECM keep alive-time) Airbag not activated 	• 0.5 s • Once / DCY	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144. Checking". page 1143.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2563 Tur- bo- charg- er Boost Con- trol Posi- tion Sen- sor "A" Circuit Range/Per- for manc		Boost pressure actuator sensor voltage > 4.52; < 2.73 V Molkswagen AG. Vo	Gradient of boost pressure >= -2.98 %/s kswagen AG does not guaran guaran		• 2 DCY	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
Eur- bo- charg- er Boost Con- trol Posi- tion Sen-	charger Boost Con- trol Position Sensor Short To Ground / Open Cir- cuit	boost control position sen- sor voltage < 0.20 V		• Continuous	• 2 DCY	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
P2565 Tur- bo- charg- er Boost Con- trol Posi- tion Sen- sor "A" Circuit High	charger Boost Con- trol Position Sensor	Turbocharger boost control position sensor voltage > 4.80 V	DA nagen AG.	• Continuous	• 2 DCY	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .

De- Stra		Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2610 Engir ECM/ Time PCM Engine Off Timer Performanc e	Ra- ity k	• Or hitlessautho	 SPI communicals tion finished ECM internal time valid Choice of: ECM keep alive time active ECM internal timer reset not activated Time delay >= 1.0 s Or Delay timer for acquisition of engine off time > 1.0 s (hardware values) Or Result of low power check initialization > 0.0; < 9.0 [-] 			- Check power and ground inputs to ECM first. Refer to appropriate wiring schematic for pin locations. If all powers/ grounds to ECM are present, replace the Engine Control Module - J623 Refer to appropriate repair manual.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Engine Off Time ECM Internal Timerio Check	 ECM internal timer initialisation failure Or ECM internal timer communication failure 	ECM internal timer reset not active SPI communication failure after reset not detected	1.3 sContinuous	A lear	nect to the correctness of
O2 Sen- sor	O2 Sensor Pumping Current Trim Circuit/ Open Bank 1 Sensor 1		 Modeled exhaust temp < 700° C O2S ceramic temp > 715° C 	• 1.5 s	• 2 DCY	Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Re-
Current Trim Circuit/ Open Bank 1 Sensor 1		TO THOUSE OF THE PROPERTY OF T	 Fuel cut off active Heater control closed loop No low fuel signal 	geweylo V Volry	2 DOT Malion in the second sec	fer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152

gine t	Engine Tempera- ture Too Low	 Cooling system tem temperature < 74° C – 		• 4.0 s	0.001	
		84° C after AAT check			• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor - G62 Refer to ⇒ "3.6.9 En- gine Coolant Temperature Sensor G62, Checking", page 1117.
	rojal purposes, in part orin who _{le} ;	the sauthorized by the sauthoriz	Volkswagen AG. Volkswage	an AG does not g	Harantee Oracceptan, Ita	- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83- Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 Checking", page 1119 . - Check the After-Run Coolant Pump - V51- Refer to ⇒ 3.6.2 After-Run Coolant Pump V51, Checking", page 1103 .
	a) be	The so to a serie of the series of the serie			KOWEUKOO TIBUROS	Check the

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P334 A Actua- tor Elec- trical Error	Turbo- charger Boost Rres- sure Con- trol Valve Short Cir- cuit	bypass valve driver current > 9.3 – 15.0 A (hardware val- ues)	Boost pressure actuator control ler active	Diany lability	Z.	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .
or commercial purposes, in part or in whole, is holds				10%	th respect to the correctness of information ,	- Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249, Checking", page 1172.
U000 ** High Speed CAN Com- muni- cation Bus	CAN: Pow- ertrain BUS Reading Back Sent Message Powertrain	• Message no feedback	• Time after ignition on 0.5 s	• 0.5 s	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
U000 2 High Speed CAN Com- muni- cation Bus Per- for- manc e	CAN: Glob- al Time Out CAN Com- munication	• General CAN timeout >= 0.4 s	 Time after ignition on >= 0.5 s 	0.5 sContinuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
muni-	CAN: Transmis- sion Control Module (TCM) CAN Communi- cation With TCM	Received CAN mes- sage no mes- sage	Time after ignition on >= 0.5 s attention on >= 0.5 s attention on >= 0.5 s	0.5 s Continuous wagen AG. Volk	• 2 DCY	- Check the CAN-Bus terminal resistance between the Transmission Control Module and the Engine Control Module - J623 - Refer to 3.6.6 CAN-Bus Terminal Resistance, Powertrain, Checking, page 1112
muni-	CAN: Brake System Control Module (BSCM) CAN Com- munication With Brake Unit	Received CAN message no message **Garage of the commercial properties of the commercial propertie	Time after ignition on >= 0.5 s	• 0.5 s • Continuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
Com- muni- cation With	CAN: Body Control Module (BCM) CAN Communi- cation With Body Con- trol Module	Received CAN mes- sage no mes- sage	Time after ignition on >= 0.5 s	• 0.5 s • Continuous	• 3 DCA	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
U014 6 Lost Com- muni- cation With Gate- way "A"	CAN: Gate- way CAN Communi- cation With Gateway	Received CAN mes- sage no mes- sage	Time after ignition on >= 0.5 s	0.5 s Continuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U015 5 Lost Communication With Instrument Panel Cluster (IPC) Control Module	CAN: In- strument Cluster CAN Com- munication With Instru- ment Clus- ter Module	Received CAN mes- sage no mes- sage	Time after ignition on >= 0.5 s Mass authorised by Volkswagen Mass authorised by Volkswagen	 0.5 s Continuous AG. Volkswage	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
U030 2 Soft- ware In- com- pati- bility With Trans- mis- sion Con- trol Mod- ule	ECM: Cod- ing Code Check Of ECM Con- cerning TCM	Received AT vehicle data from TCM signal nal signal of the second o		• 50.0 s • Continuous	• 2 DCY	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module . Refer to appropriate repair manual.
U032 3 Soft- ware In- com- pati- bility With Instru- ment Panel Con- trol Mod- ule	CAN: Ambient Air Temperature Sensor Communication With Instrument Cluster Module	perature sen-	• Time after ignition on > 1.2 s	• 1.0 s • Continuous	DA negeweylo V ton	- Check for correct soft-ware version and VIN or update soft-ware for the IPC Module if available. If OK, replace the Instrument Cluster Control Module - J285 - Refer to appropriate repair manual.
Data Re-	CAN: Transmis- sion Control Module (TCM) CAN Communi- cation With TCM	Received data from TCS im- plausible message	Time after ignition on >= 0.5 s	0.5 sContinuous	• 2 DCY	 Check for software up- dates and TSB's. Re- program as necessary. If none are found, re- place the Transmis- sion Control Module . Re- fer to appro- priate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure
Data Re- ceived	cle Speed Sensor CAN Com- munication With Vehi- cle Speed Sensor	 Speed sensor signal: sensor error 327.42 km/h Speed sensor signal: initialisation error 327.08 km/h Speed sensor signal: low voltage error 327.25 km/h Speed sensor signal: range error 326.40 – 327.07 km/h Or Speed sensor signal: range error 327.09 – 327.24 km/h Or Speed sensor signal: range error 327.26 – 327.41 km/h Or Speed sensor signal: range error 327.46 – 327.41 km/h Or Speed sensor signal: range error 327.43 – 327.67 km/h 	tion on > 500.0 ms	A nogeweylovy	• 2 DCY **Tantee or accepted the life of	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109.
	CAN: Brake System Control Module (BSCM) CAN Com- munication With Brake Unit	Received data from TCS im- plausible message	Time after ignition on >= 0.5 s			
	Vehicle Speed Ra- tionality Check High	• Vehicle speed > 325 km/h		• 2.0 s • Continuous		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U042 2 Invalid Data Re- ceived From Body Con- trol Mod- ule	Invalid Data Received From Body Control Module	Ambient tem- perature value initialization failure	 Status ambient temperature from instrument clus- ter no fault Electrical check ambient tempera- ture sensor no fault 	• 2.0 s	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
Data Re- ceived From Instru-	CAN: In- strument Cluster CAN Com- munication With Instru- ment Clus- ter Module	Received data from instru- ment cluster implausible message	tion on >= 0.5 s	0.5 sContinuous	• 2 DCY	 Check for correct soft- ware version and VIN or update soft- ware for the IPC Module if available. If
ment Panel Clus- ter Con- trol Mod- ule	CAN: Ambient Air Temperature Sensor CAN Communication With Ambient Air Temperature Sensor	Ambient air temperature signal failure Ambient temperature Ambien	• Time after igni, AG tion on A 0.5 s	• Continuous	G does not guarante	available. If OK, replace the Instrument Cluster Control Module - J285 Refer to appropriate repair manual.
	CAN: Ambient Air Temperature Sensor Communication With Instrument Cluster Module	Ambient temperature sensor Source in reset failure	 Time after ignition on > 1.2 s Engine running 	2.0 sContinuous		pair manual.
	CAN: Gate- way CAN Communi- cation With Gateway	Received data from Gateway implausible message	• Time after ignition on >= 0.5 s	• 0.5 s • Continuous	• 2 DCY	Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance. Checking",
			Profected by copyring	.ĐA,	THE NOTH SUBJECT OF THE PROPERTY OF THE PROPER	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
U110 3 Pro- duc- tion Mode	ECM: Production Mode Function Monitoring: Mode Change		Vehicle speed < 5 km/h Max trip mileage since initial vehicle start-up < 100 km During ECM keep alive-time after ignition off Engine speed 0 RPM For hybrid: Drive motor off	• Contin-		Py Wehicle is in production mode. Refer to appropriate repair manual for resolution. Note the mode can be deactivated with a factory scan tool or will automatically turn off after vehicle accumulates the first 100 km (62.14 miles) of driving.	a cook and liability with respect to the correctness of information in the contract of the correctness of information in the contract of the correctness of information in the contract of the correctness of information in the correctness of info

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DTC De- scrip tion	Strategy		Secondary Parame- ters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
P000 A "A" Cam shaf Posi tion Slov Re- spon e Banl 1	Valve Timing (VVT) Intake Actuator Rationality Check Section 1997 Check Compared to the control of the contr	• Adjustment angle difference >= 3.0; < 15.0° CRK	 Modeled oil temperature -40 – 160° C Engine speed 608 – 6,016 RPM Set point change > 29.0° CRK Camshaft position n.a. Dynamic diagnosis timer >= 0.95 – 4.0 s 	• 0 (FTP75: 300.0) s • Continuous	• 2 DCY (NAR)	- Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205, Checking", page 1105 . Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 . Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve N276 Checking", page 1129 . Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0010 "A" Cam- shaft Posi- tion Actua- tor Con- trol Cir- cuit/	Variable Valve Tim- ing (VVT) Intake Ac- tuator Open Circuit	Output voltage lower range 1.92 – 2.21 V Output voltage upper range 2.85 – 3.25 V	Actuator com- manded off	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.
Open Bank 1		ses, in part or in whole, is not portion its section in the section is a section in the section in the section in the section in the section is a section in the section in the section in the section is a section in the section in t	Streeze authorized by Volkewager Streeze authorized by Volkewager	AG. Volkswag		- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 Check the Camshaft Adjustment Valve 1 N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205, Checking", page 1105.
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			vise ⁰			adrapt
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0011 "A" Cam- shaft Posi- tion - Tim- ing Over- Ad- vance d or Sys- tem Per- for- manc e Bank 1	Variable Valve Tim- ing (VVT) Intake Ac- tuator Ra- tionality Check	Camshaft position deviation > 10.0° CRK CRK Output Description of the part of the	 Modeled oil temperature -40 – 160° C Engine speed 608 – 6,016 RPM Camshaft position adjustment active Catalyst heating not active Camshaft position deviation integrator (actual vs. set point position) >= 9.0 – 12.0° CRK*s 	• 0 (FTP75: 250.0) s • Continuous		- Check the Engine Speed Sensor - G28- Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121 Check the Camshaft Position Sensor - G40- Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 Check the Camshaft Adjustment Valve 1 - N205- Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205- Refer to cos ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205- Refer to cos ⇒ "3.6.3 Checking", page 1105.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time ^{S no} Length	MIL Illumina- tion	Component Diagnostic Procedure
	Camshaft Position / Crankshaft Position (CMP/CKP) Intake Sensor Adaptation Value Monitoring	Adapted value for each edge of the target wheel < -14.0° CRK Adapted value for each edge of the target wheel > 14.0° CRK Adapted value for each edge of the target wheel > 14.0° CRK	 tion adaptation (exhaust side) active Engine speed 288 – 4,000 RPM Modeled oil temperature >= -15° C Modeled oil temperature <= 160° C 	• 720.0° CRK • Multiple	• 2 DCY and the state of the st	Speed Sensor - G28 Refer to "3.6.11 Engine Speed Sensor G28, Checking", page 1121. Check the Camshaft Position Sensor - G40 Refer

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0030 HO2S Heat- er Con- trol Circuit Bank 1 Sen- sor 1	er Front Open Cir- cuit	 O2S front heater voltage lower range 1.92 – 2.21 V O2S front heater voltage upper range 2.85 – 3.25 V 		2.5 sContinuous	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
HO2S Heat- er Con- trol Circuit Low Bank 1 Sen- sor 1		O2S front heater voltage < 1.92 – 2.21 V		2.5 sContinuous	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 .
HO2S	Oxygen Sensors (O2S) Heat- er Front Short To Battery Plus	O2S front heater driver temperature 160.0 200.0° C control of the	Modeled EGT @ Actuator commanded on	• 2.5 s	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking". page 1152.
Tur- bo- charg-	Turbor charger By-pass (TCBY) Open Circuit	Voltage lower range 1.92 – 2.21 V Voltage upper range 2.85 – 3.25 V (hardware values) Voltage upper range 2.85 – 3.25 V (hardware values)	manded off	• 1.0 s • Continuous	• 2 DCY (NAR)	Check the Turbocharg-er Recirculation Valve - N249 Refer to \$\int_{00}\$ "3.6.35 Turbocharg-er Recirculation Valve N249. Checking", page 1172. Check the Actuator - V465 Refer
		~19p	DAn.	, rolkswage		to ⇒ "3.6.7

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable gentle Conditions	Monitoring AG Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Turbo- charger By- pass (TCBY) Short To Battery Plus	Current driver stage internal value Temperature > 160 – 200° C (hardware values)	Actuator commanded on		* Sand Condition of the	Nwith respect to the correctne
P0034 Tur- bo- charg- er/Su- per- charg- er By- pass Valve "A" Con- trol Circuit Low	Turbo-	Voltage < 1.92 - 2.21 V (hardware values) Republic to the control of the contro	• Actuator commanded off	• 1.0 s • Continuous .	• 2 DCY (NAR)	- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 Checking", page 1172 . - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .
	Oxygen Sensors (O2S) Heat- er Rear Open Cir- cuit	 O2S rear heater voltage lower range 1.92 – 2.21 V O2S rear heater voltage upper range 2.85 – 3.25 V 	Engine not in start process	2.5 sContinuous	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P0037 HO2S Heat- er Con- trol Circuit Low Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Heat- er Rear Short To Ground	O2S rear heater voltage < 1.92 – 2.21 V	Engine not in start process	2.5 sContinuous	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.	
P0038 H02S Heat- er Con- trol Circuit High Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Heat- er Rear Short To Battery Plus	 O2S rear heater driver temperature > 160.0 - 200.0° C O2S rear heater driver output current driver stage internal value 	 Modeled EGT @ O2S rear >= 300° C O2S heater commanded on 	2.5 sContinuous	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149	
P0045 Tur- bo- charg- er/Su- per- charg- er Boost Con- trol "A" Cir- cuit/ Open	Turbo- charger (TC) Boost Pressure Control Open Cir- cuit	driver load resistance > 200 kΩ	Deviation between actual and filtered boost pressure actuator position <= 5.0% Boost pressure control not active Time delay > 1.0 solutions in the control of		• 2 DCY B. VO(NAR)*nAG	- Check the Turbocharg- en Recirculation Valve - N249- Refer to ⇒ "3.6.35 Turbocharg- er Recirculation Valve N249, Checking", page 1172. - Check the Actuator - V465- Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.	with respect to the correctness of information of the correctness of t
			O SOUTH OF BUILDOD WISHAGO	Protected by	- ĐA _{nt}	SENEMO VOLKSWAGO	71
					3. Diagi	nosis and Testing ರ	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0049 Tur- bo- charg- er/Su- per- charg- er "A" Tur- bine Over- speed	Turbo- charger (TC) Boost Pressure Control Out Of Range High	 Turbocharger speed >= 213,000 RPM IAT @ throttle >= 336° C For time >= 25.5 s 	Engine running	• 2.6 s • Continuous	• 2 DCY (NAR)	- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 , Checking", page 1172 . - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .
MAP/ MAF - Throt-tle Position Correlation MAP/ _{systolous} (systolous) Application MAP/	Manifold Absolute Pressure (MAP) Sen- sor Large Leakage Detection		 Fast throttle adaptation finishwaged adoptation finishwaged	or acceptant liability will.	2 DCY (NAR) 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3 - Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 . - Check the Intake Manifold Sensor - GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 . - Check the EVAP Canister Purge Regulator Valve 1 - N80 - Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80 - Checking", page 1123 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake Air (IA) System Rationality Check	Throttle opening area correction included controller and adaption < -60.0% Lambda correction included controller and adaption -28.0 – 28.0% Lambda controller and active	 Intake manifold modeled adaptation active (by throttle opening area) Throttle position 0.000 – 100.003° TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] Fast throttle adaptation finished MAP gradient -200.0 – 200.0 kPa/s Fuel cut off not active Time after engine start > 5.0 s Turbocharger boost pressure agen 135.0 kPagen AG do BARO 73.0 – 107.50 kPa 	es not guarante,		
Ambient Air Temperature Sensor Circuit "A"	rt or	AAT sensor voltage (hardware values) > 4.50 V		2.0 sContinuous	• (NA) Individual National States of Information in this order in the state of the	page 1148
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Ambient Air Tempera- ture (AAT) Sensor Cross Check	IAT @ first engine start > 20 K (depending on engine off time) • Diff. AAT vs. ROT @ first engine start > 20 K (depending on engine off time) • Diff. IAT vs. ROT @ first engine start <	 Engine off time > 360.0 m Decrement check to ensure a cold vehicle state: Diff. IAT vs. min. IAT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s Diff. ROT vs. min. ROT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s Diff. AAT vs. min. AAT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s 	• Once / DCY	• 2 DCY (NAR)	- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148 Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
	COM: Ambient Air Temperature (AAT) Sensor Short To Ground	AAT sensor voltage < 0.10 V (hardware values)	ELEGO TO BEAUTHOUS THOUSE DO SHOUSE DO SAGE	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148. - Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0087 Fuel Rail/ Sys- tem Pres- sure - Too Low Bank 1	Fuel Rail Pressure (FRP) Out Of Range Low	 Deviation between reference fuel pressure set point and current fuel pressure > 2,000.10 kPa Case 1: Deviation lambda of controller included adap- 	 General: Engine speed > 608 - 6,816 RPM Fuel mass set point 15.01 - 1,389.0 mg/rev Time after engine start > 5.0 s Engine warm-up not calibrated 	2.0 sContinuous	• 2 DCY (NAR)	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair
		 tiour adaption -50.0 – 50.0% High pressure controller output > 30 mg Fuel pressure < 2,500.0 kPa Case 2: Fuel pump at max limit max limit set point not 	Depending on	ragen AG does _l	ot guarantee or accept	manual. - Check the Fuel Pressure Sensor-G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131. - Check the
	Fuel Rail Pressure (FRP) Ra- tionality Check Low	calibrated mg/rev • Fuel pressure not calibrated kPa Deviation lambda of controller included adaption -50.0 – 50.0% High pressure controller output > 35 mg	low dynamic conditions: Fuel mass set point lower range > 1.99 mg/rev For time >= 5.0 s Fuel mass set point upper range < 100.32 – 172.41 mg/rev Fuel mass set point gradient -1,389.0 – 2.20 mg/rev For time >= 1.2 s	• 5.0 s		sure Regulating Valve - N276 Refer to 3.6.15 Fuel Pressure Regulator Valve N276. Checking", page 1129. Check the Fuel Delivery Unit- GX1-/Fuel Pump Control Mod-
		Deviation be- tween fuel pressure set point and cur- rent fuel pres- sure > 2,000.10 kPa Fuel pressure < 2,500.0 kPa	Depending on canister purge: Canister load not calibrated [-] Evap purge valve not calibrated	-DA negswe.	IO NA WAYAYA O iya i	ule - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Mod- ule J538 , Testing", page 1125 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring n ACTime Water Length	en AG tjon Bes not gu	Component Diagnostic Procedure
P0088 Fuel Rail/ Sys- tem Pres- sure - Too High Bank 1	Fuel Rail Pressure (FRP) Out Of Range High	Deviation between fuel pressure set point and curvent fuel pressure < -2,000.10 kPa Deviation lambda of controller included adaption -50.0 - 50.0% Case 1: High pressure controller output < -30 mg Case 2: Flow control valve open Mass fuel flow set point > 15.01 mg/rev	Catalyst purge not calibrated Lambda control not calibrated	• 5.0 s • Continuous	• SA negswealo V _t v	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/ or to appropriate repair manual. - Check the Fuel Pressure Sensor G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247. Checking". Page 1131 . - Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276. Checking". page 1129 .
P0090 Fuel Pres- sure Regu- lator 1 Con- trol	Fuel Vol- ume Regu- lator Con- trol Open Circuit	 Voltage high side < 1.87 – 2.26 V Voltage low side > 2.78 – 3.33 V 	 Engine speed 0 RPM Fuel cut off active Actuator commanded off 	• 0.2 s • Continuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cir- cuit/ Open		 Low and high side off: Voltage low side > 2.78 – 3.33 V Voltage high side < 1.87 – 2.26 V Low and high side on: Current low side driver stage internal value Current high side driver stage internal value 	Engine speed > 600 RPM Fuel cut off not active Actuator commanded on North manded on North Manager Statistics and North	igen AG. Volksi	vagen AG does no	Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125. Check the Fuel Pressure Regulator Valve N276 - Refer to 3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
P0091 Fuel Pressure Regulator 1 Control Circuit Low	Fuel Vol- ume Regu- lator Con- trol Short To Ground (High Side) Fuel Vol- ume Regu- lator Con- trol Short To Ground (Low Side)	Current high side driver stage internal value (hard-ware values) Voltage low side < 1.87 – 2.26 V (hard-ware values)	 Ignition on Ignition off (during ECM keep alive-time) Actuator commanded on Ignition on Ignition off (during ECM keep alive-time) Actuator commanded off 	• 0.2 s • Continuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 Fuel Pump Control Module J538 , page 1125 . - Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve - N276. Checking", page 1129 .
	Fuel Control Valve Short To Battery Plus (Low Side)	Current low side driver stage internal value (hard- ware values)	Ignition on Ignition off (during ECM keep alive-time) Actuator commanded on	0.2 s Continuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 ,

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Control Valve Short To Battery Plus (High Side)	Voltage high side < 2.78 – 3.33 V (hard- ware values)	Ignition on Ignition off (during ECM keep alive-time) Actuator commanded off Volkswagen AG. Volkswagen AG. Volkswagen AG.	agen AG does n	of guarantee or ac	Testing", page 1125. - Check the Fuel Pres- sure Regula- tor Valve - N276 Refer to ⇒ "3.6.15 Fuel Pres- sure Regula- tor Valve N276, Checking", page 1129.
er/Su- per-		Boost pressure actuator position controller output > 98.0% Boost pressure actuator position controller output < -98.0%	 Time after engine start >= 4.0 s ECT > -40° C AAT > -40° C Catalyst heating not active Boost pressure control active 	• 0.4 s • Continuous	• 2 DCY (NAR)	- Check the Actuator - V465 Refer to = "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113
"A" Mod- ule Per- for- manc e	Turbo- charger (TC) Boost Pressure Control Functional Check	Deviation boost pres- sure actuator position con- troller > 16.0 – 100.0%	 Time after engine start >= 4.0 s ECT > -40° C AAT > -40° C Boost pressure control active 			correctness of information in this ode.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
	Manifold Absolute Pressure (MAP) Sen- sor Engine Standing: Cross Check	time) n.a. kPa				- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169. - Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31 Checking", page 1115. - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139.	A and lied.

DTC / Monitor De- crip- Description		Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Diff. BARO mean value vs. MAP mean value n.a. kPa				
Manifold Absolute Pressure (MAP) Sen- sor ECM Keep Alive- Time: Cross Check	 Case 1: Charged engine Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure <= 7.50 kPa Diff. turbocharger boost pressure vs. MAP > 7.50 kPa Case 2: Non charged engine Diff. BARO mean value @ ECM keep alive vs. MAP mean value @ ECM keep alive time > n.a. kPa 	 Time after engine stop >= 5.0 s BARO sensor voltage 0.20 – 4.80 V 		gen A.G. Volkswa ₍	en AG does not guaran.
Intake Air (IA) System Rationality Check	Throttle opening area correction included controller and adaption > 40.0% Lambda correction included controller and adaption < -28.0%	 MAP sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V Intake manifold modeled adaptation active (by throttle opening area) Throttle position 0.000 – 100.003 TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] Fast throttle adaptation finished MAP gradient –200.0 kPa/s Fuel cut off not active 	• 5.0 s • Continuous	to1 ^d	DA nagawagan VCI ng

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Hill Hill Hill Hill Hill Hill Hill Hill	authorised by Volk	Throttle opening area correction included controller and adaption < 40.0% Lambda correction included controller and adaption > 28.0%	Time after engine start > 5.0 s Turbocharger boost pressure < 135.0 kPa BARO 73.0 – 107.50 kPa AG does not guarantee or accept			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Mani- fold		Intake mani- fold pressure sensor volt- age < 0.20 V		• 0.5 s • Continuous	• 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169 .
Low						- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .
			, thorised by Volke V	ragen AG. Volks	swagen AG does no	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 , Checking",
		es, in part or in whole, is not.	Partition of the state of the s			- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123
		ommercial purpose	S. B.			Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 .

PO110 Intake manifold Absolute Pressure Sensor with Jule Pressure Sensor with Jule Pressure Sensor with Jule Pressure Sensor Circuit High Po111 Intake Air Temperator Cross ture Sensor 1 Circuit Rang e/Performance Bank 1 Point Mark Sensor Cross ture Sensor 1 Circuit Rang e/Performance Bank 1 Point Mark Sensor Cross ture Sensor Cross Sensor Sen	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Sensor 1 Circuit Rang e/Per- for- manc e Bank 1 Diff. IAT vs. ROT @ first engine start > 20 k (depending on engine) off time) Diff. AAT vs. ROT @ first engine start < 20 k (depending on engine) off time) Diff. AAT vs. ROT @ first engine start < 20 km/h For time > 20.0 s Diff. ROT vs. min. ROT @ condition < 4.5 k Vehicle speed > 20 km/h For time > 20.0 s Diff. AAT vs. ROT @ first engine start < 20 km/h For time > 20.0 s Diff. AAT vs. ROT @ condition < 4.5 k Vehicle speed > 20 km/h For time > 20.0 s Diff. AAT vs. min. ROT @ condition < 4.5 k Vehicle speed > 20 km/h For time > 20.0 s Diff. AAT vs. min. AAT @ condition < 4.5 k Vehicle speed > 20 km/h For time > 20.0 s Diff. AAT vs. min. AAT @ condition < 4.5 k Vehicle speed > 20 km/h	Manifold Absolute Pressure/ Barometric Pressure Sensor Circuit	Pressure Sensor Short To	fold pressure sensor volt-		Continuous	(NAR)	take Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 , Checking", page 1139 .
VO'8	Intake Air Temperature Sensor 1 Circuit Rang e/Performanc e Bank	Tempera- ture (IAT) Sensor Cross	AAT @ first engine start > 20 K (depending on engine off time) • And Diff. IAT vs. ROT @ first engine start > 20 K (depending on engine off time) And Diff. AAT vs. ROT @ first engine start < 20 K (depending on engine off time) • Soodmand of time)	 Decrement check to ensure a cold vehicle state: Diff. IAT vs. min. IAT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s Diff. ROT vs. min. ROT @ condition < 4.5 K Vehicle speed > 20 km/h For time > 20.0 s 			Take Manifold Sensor GX9, Checking page 1139. - Check the Charge Air Pressure Sensor - G31- Refer to ⇒ "3.68 Charge Air Pressure Sensor G31, Checking", page 1115.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value olkswagen AG. Volkswagen AG.	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake Air Tempera- ture (IAT) Sensor Short To Ground	• IAT sensor voltage < 0.10 V	Secondary Parameters with Enable Conditions agen AG does not guarantee of	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking". page 1139 .
or commercial purposes, III part of				• 20 s	othe correctness of inte	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .
Intake Air	Intake Air Tempera- ture (IAT) Sensor Open Cir	• IAT sensor voltage > 4.50 V	.DA nagswesylo V Vo mężnycą	• S Contin-	• 2 DCY (NAR)	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 .
						- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .

	T	1055			ACV.	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0116 Engine Coolant Temperature Sensor 1 Circuit Rang e/Performanc e	Engine Coolant Tempera- ture (ECT) Sensor Nouse Change Office Signal	Diff. max. ECT vs. min. ECT < 1.5 K	 ECT range conditions: ECT @ start < 82; > 98° C ECT @ start not calibrated ° C Driving condition H: Engine part load Engine full load Engine speed > 1,300 RPM Vehicle speed >= 50 km/h Ratio air mass flow > 6.0% Time after conditions are fulfilled > 30.0 - 60.0 s Driving condition L: Engine idle Vehicle speed not calibrated km/h Or Fuel cut off active Time after conditions are fulfilled > 30.0 - 60.0 s 	• Once / DCY	• 2 DCY (NAR)	- Check the Engine Coolant Temperature Sensor - G62 Refer to \$\infty\$ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117. - Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 Refer to \$\infty\$ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119.
	Engine Coolant Tempera- ture (ECT) Sensor @ Cylinder Block Ra- tionality Check Low	Difference be- tween model- led and meas- ured cylinder block temper- ature > 10° C	 ECT @ cylinder block -128 – 127° C Time after engine start > 60.0 s 	• 10.0 s • Continuous		
	Engine Coolant Tempera- ture (ECT) Sensor @ Cylinder Block Ra- tionality Check Inap- propriately Low	Diff. min temperature of cross check sensors vs. ECT @ cylinder block @ engine start >= 10° C	Cross checks fin- ished	• 1.0 s • Once / DCY		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Engine Coolant Tempera- ture (ECT) Sensor @ Cylinder Block Ra- tionality Check High	ECT @ cylin- der block @ engine start > 40 – 80° C	• Engine off time >= 240.0 m	• 3.0 s • Once / DCY		
En- gine	Engine Coolant Tempera- ture (ECT) Sensor Short To Ground	ECT sensor voltage < 0.30 V		0.5 s Continuous	• 2 DCY (NAR)	- Check the Engine Cool- ant Temper- ature Sensor - G62 Refer to ⇒ "3.6.9 En- gine Coolant Temperature Sensor G62, Checking", page 1117
			es, in part or in whole, is not beaming the part of in whole, is not beaming the part of t	reed by Volkswar	en AG. Volkswage	Check the Engine Coolant Temper, ature Sensor on Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 , Checking", page 1119 .
			Copyride of commercial purposes, im part	Olydos Agpara-		ant Temperature Sensor on Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 . Checking". page 1119 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0118 Engine Coolant Temperature Sensor 1 Circuit High	Engine Coolant Tempera- ture (ECT) Sensor Short To Battery / Open Cir- cuit	ECT sensor voltage > 4.90 V Recommercial purposes, in part or in whole, is not being a serious of one with the serious of the serious o	IAT at throttle >= -33° C Time after engine start > 60.0 s The start > 60.0 s	• Continuous	(NAR)	- Check the Engine Coolant Temperature Sensor G62 - Refer to ⇒ "3.6:9 Engine Coolant Temperature Sensor G62 - Checking", page 1117 . - Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 - Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet - G83 - Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 - Checking", page 119 .
Throt- tle/	sor (TPS) 1 Rationality Check	 Normalised difference between measured and modeled value of mass air flow from TPS 1 >= 1.0 [-] Relative mass air flow integral from TPS 1 > 60.0 [-] Difference between TPS 1 and TPS 2 > 6.499° TPS 	Throttle adaptation (@ initial start or after detection of throttle exception change or checksum error) not active	Contin-	2 DCY (NAR)	- Check the Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
Throt- tle/	Throttle Position Sensor (TPS) 1 Short To Ground	Throttle position sensor 1 voltage < 0.17 V		• 0.2 s • Continuous	• 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0123 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "A" Circuit High	Throttle Position Sensor (TPS) 1 Short To Battery Plus	Throttle position sensor 1 voltage > 4.83 V	_{Olks} wagen AG, Volkswager	0.2 s AG does Conting uous	• 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 - Check the Øxygen Sen-
P0131 O2 Sen- sor Circuit Low Volt- age Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Front Short Tour Ground	o sterring to	Engine running	0.5 sContinuous		sor 1 Before Catalytic Converter - GX10 Refer to "3.6.26 Oxygen Sensor 1 Before Catalytic Converter
P0132 O2 Sen- sor Circuit High Volt- age Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Front Short To Battery Plus	O2S sensor voltage > 5.20 – 5.35 Voltage)	• Engine running	• 0.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
O2 Sen- sor	Oxygen Sensors (O2S) Front Dynamic Path Response Check	Average check Mean value of normalised signal amplitude >= 1.0 [-] Ratio check Ratio of failed diagnostic cycle n.a. [-] Remarks authorized by Value of the control of	 Conditions range 1: (standard parameters) General conditions: Time after engine start not calibrated s ECT >= -48° C Vehicle speed not calibrated km/h Integrated air mass after gear change not calibrated kg MAF 0.0 – 1,389.0 mg/rev Integrated air mass per cylinder not calibrated kg Static conditions: O2S front ready Lambda stimulantion active Lambda control value -35.0 – 35.0% Engine speed 928 – 3,008 RPM MAF to activate diagnosis function 150.0 – 600.0 mg/rev MAF per segment > 18.0 kg/h Normalized integrated fuel mass in oil < 255.0 [-] Catalyst purge not active Limited dynamic conditions: Integrated air mass after dynamic conditions: Integrated air mass after dynamic conditions: Integrated air mass after dynamic conditions are fulfilled not calibrated g Dynamic engine speed < 150 RPM 	• 4.4 s • Once / DCY AG does not gua,	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Dynamic MAF not calibrated mg/rev			
			 Dynamic MAF per segment < 30.0 kg/h 			
			Dynamic lambda not calibrated %			
			 Change of dy- namic torque < 0.07 [-] 			
			 Conditions range 2: (Diagnosis carried out together with the catalyst efficiency diagnosis) General conditions kswagen AG door tions kswagen A			
		wews.	General condi- gen tions lkswagen AG do.			
		thorised by Volks.	 Vehicle speed >= 10 km/h 	s not guarantee		
	8	nessau	 BARO not cali- brated kPa 		ACC SOFA	
	, not berniit.	ndes authorised by Volkswa	 Catalyst over- heating protec- tion not active 		Middliffymii	
	'in whole, is		 Turbine over- heating protec- tion not active 		hrespectto	
	oart or		O2S rear ready		thec	
	ses, in p		O2S heater rear active		orrecine	
	oduno		O2S front ready		40 SSE	
	ummercial I		 Internal resist- ance O2S rear <= 700.0 Ω 		informatic	
	S to Stanife		 Time after a catalyst purge phase >= 0.02 s 		"ninthis Oc	
	`*c	THANAGO THOMAGOS AG -	 O2S heater rear active O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s Engine speed 1,344 - 3,008 RPM 	ONO V VO MO MONO	orrectness of information in this ook the state of the st	
		·4 ₽θ∂ ₃ Ο _€	Time after engine start > 230.0 – 1,000.0 s	N⊇Vı		
			• Engine speed 1,344 – 3,008 RPM			
			 Lambda control value < 50.0% 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Deviation of lambda controller output @ start di- agnosis < 10.0%			
			Deviation of lambda controller output during di- agnosis < 8.0 – 15.0%			
			Fast trim control not calibrated			
			Proportional part of secondary fuel control loop < 0.25 [-]			
			Coasting function not active			
			Lambda adapta- tion not active			
			Valve lift not equipped old was wagen.	kG. Volkswage	AG does not a	
			Temperature Conditions:		ada _{ra}	nteg Orac
			~~ Signal (tmot) > 60° C		7	CC Pr
		notbern,	• ~~ Signal (tans) > -48° C			A THE WALL
		: or in whole, is	Coasting function not active Lambda adaptation not active Valve lift not equipped we wagen equipped of the conditions: "Comperature expenditions: "Comperature equipped (tans) > 60° C "Comperature expenditions: "Comperature expensions: "			h respect to th
		rposes, in part	Modeled catalyst temperature @ start of diagnosis 500 – 700° C			e correctiness
		commercial pu	 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 			of information
		or commercial purposes, in part or in whole, is not be mitted.	Integrated air mass, catalyst temperature con- ditions fulfilled not calibrated g			ing the second s
			Diff between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K	. je	A nagewaylo V yd y	te correctness of information in this Robinstein of the correctness of information in this Robinstein of the correctness of information in this Robinstein of the correctness of information in the correctness of information in this Robinstein of the correctness of information in the correctness of information in this Robinstein of the correctness of information in the correctness of information in the correctness of information in the correctness of the correctness of information in the correctness of the correctness o

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K			
			• Modeled EGT @ O2S rear <= 1,201° C			
			Air mass conditions:			
			Air mass @ start of diagnosis 125.01 – 580.0 mg/rev			
			Air mass during diagnosis not calibrated mg/rev			
			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h			
			MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			
			Load conditions:			
		10/4	• Air mass set point 125,01 old 580,0 pwagng/rev	doesno		
		authorised by Ver	Engine load not calibrated %	TOT GUARAR	ice or	
		a dilles so	 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 cl. 580.0 n/Acmg/rev Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated % Low dynamic 		** **Cebran	
	isnothe		For time not cali- brated %		III WILL	
	in whole,		Low dynamic conditions:			spectt
	part or		Dynamic engine speed < 20 RPM			o the co
	urposes, in		Dynamic air mass < 25.01 mg/ rev			rrectnesso
	ommercial p		Dynamic lambda controller output < 20.0%		One.	finform
	0100%	Redundes authorise addy Volk	Integrated air mass after dy- namic conditions are fulfilled > 20.0		allon in this cook	
		JUDINAOO NAD	• Evap purge conditions	DEWSHOV VOING	, Cobai	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure
tion whole, is ,	in the state of th	Malfunction Criteria and Threshold Value	 Evap purge valve not calibrated Case 2: Canister load calculation not calibrated Evap purge valve not calibrated Case 3: 	antee Oracellan	abilitywith respect to	
ommercial purposes, in part or	500 to alabated to the top of the	Protected by Copyrig	 Canister load calculation not calibrated Evap purge valve not calibrated Case 3: Canister load not calibrated Evap purge valve not calibrated Close the gap conditions O2S rear voltage @ diagnosis start >= 0.55 V Integrated air mass to start diagnosis not calibrated g O2S front dynamic diagnosis separate not active 	MONGOO THAMBOO	othe correctness of information in \mathcal{H}_{is}	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
uon	Oxygen Sensors (O2S) Front Delay Path Response Check	Normalised lambda controller value vs. modeled lambda value >= 1.0 [-]	 General conditions O2S front ready Time after engine start not calibrated s MAF to activate diagnosis function not calibrated mg/rev Integrated air mass per cylinder >= 0.42 - 2.0 kg Vehicle speed not calibrated km/ 				
			 h Static condition Engine speed 1,056 – 3,008 RPM 		- A.G. Volkswager	AG does not guarantee	
			MAF per cylinder 15.0 – 150.0 kg/h	adby Volkswage	MAC. Vollettager	AG does not guarantee	D.
			not calibrated km/ h				Paccept Any
			 Dynamic conditions Dynamic engine 				
			speed < 288 RPMDynamic torque <				
			80.0 Nm Absolute dynamic MAF < 70.0 kg/				
			Activation due to canister purge				
			Canister purge no purge				
			Canister purge not active				INOS.
			Canister purge wait ramp open			eu/kd	J. Mani.
			 Canister purge 400 min purge Canister load 	otected by copy	d .8	A nagswallo V Volingi.	
			Canister load knownCanister purge				

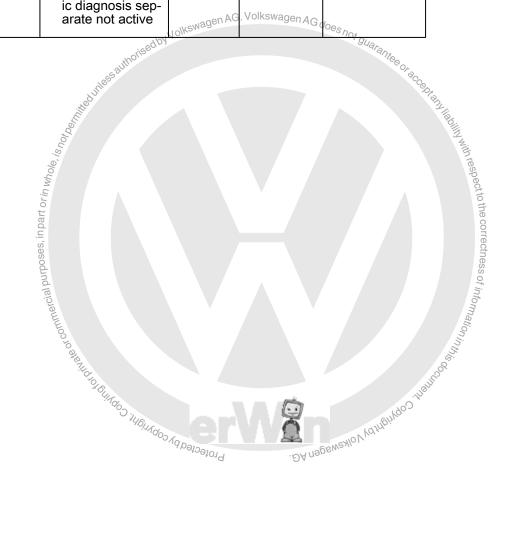
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Moving mean val- ue canister load <= 1.80 [-]			
P0135 O2 Sen- sor Heat- er Cir- cuit Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Heat- er Front Functional Check	O2S ceramic temp. < 730°C	 O2S heater commanded on For time >= 10.0 s 	20.0 sContinuous	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
O2 Sen- sor	Oxygen Sensors (O2S) Rear Short To Ground	O2S sensor voltage < 0.15 V authorised by Volkswager authorised by Volkswager		• 0.6 s • Continuous	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
Sen- sor Circuit High Volt-	Oxygen Sensors (O2S) Rear Short To Battery	• O2S sensor voltage > 5.2 – 5.35 V	O2S heater active	• 0.5 s • Continuous	2 DCY (NAR)	- Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sen- sor 1 After Catalytic Converter GX7, Check- ing"
	And things of commercial	Protected by Copyright, Cop	Kewagen AG.	ONAQUIBURDO TI	s of Information in this occurs	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P013 A	Oxygen Sensors	Gradient sen- sor voltage <	 General conditions 	• 86.5 s	• 2 DCY (NAR)	 Check the Oxygen Sen-
O2 Sen- sor	(O2S) Rear Rich To Lean Tran-	1,000.0 mV/s (arithmetic average)	 Vehicle speed >= 10 km/h 	Once / DCY	(10 (10)	sor 1 After Catalytic Converter -
Slow Re- spons	sition Re- sponse Check	avorago	BARO not cali- brated kPa			GX7 Refer to ⇒ "3.6.25
e - Rich to	Check		 Catalyst over- heating protec- tion not active 			Oxygen Sensor 1 After Catalytic
Lean Bank 1 Sen- sor 2			 Turbine over- heating protec- tion not active 			Converter GX7, Check- ing", page 1149
			 O2S rear ready 			
			 O2S heater rear active 			
			O2S front ready			
			 Internal resist- ance O2S rear <= 700.0 Ω 			
		, w Volkswagen	• Time after a cata- G. lyst purge phase >= 0.02 s	* C.		
	Aufless	uthorisede	 Integrated heat energy >= 1,600.0 - 3,000.0 kJ 	odarantee or accep		
	S not bernitte		• Time after engine start > 230.0 – 1,000.0 s		My lightlith white	
	orin whole, i		• Engine speed 1,344 – 3,008 RPM		respect to t	
9	- Lball		 Lambda control value < 50.0% 		he cor	
	la purposes,		 Deviation of lambda controller output @ start di- agnosis < 10.0% 		rectness of inf	
	ivate or commerc	introlised by Volkswagen.	Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s Engine speed 1,344 - 3,008 RPM Lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller output during diagnosis < 8.0 - 15.0% Fast trim control not calibrated Proportional part of secondary fuel control loop		ormation in this oc	
	Q1016UNG	60	Fast trim control not calibrated	, 100°	nt.	
		Protected by copyright,	Proportional part of secondary fuel control loop ○ 0.25 [-]	Vedrieing		
			 Coasting function not active 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Lambda adaption not active			
			 Valve lift not equipped 			
			Number of checks 2.0 [-]			
			Temperature conditions:			
			 ~~ Signal (tmot) > 60° C 			
			 ~~ Signal (tans) > -48° C 			
			 Modeled catalyst temperature once after engine start > 550° C 			
	itorised	by Volkswagen AG. Volks	Modeled catalyst temperature @ start of diagnosis 500 – 700° C	90		
orn.	addines salt		 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 	or accept any liability		
prin whole, is not			 Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g 	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	hrespectto	
Ipurposes, in part		by Volkswagen AG. Volk	 Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K 		he correctness of i	
or commercia	THOTO FUNCTOO THEING		 Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K 	taced and libition with the control of the control	потпан.	
	A GAINGO JAGIANO	Protected by co	Modeled EGT @ O2S rear <= 1,201° C Air mass conditions:	COP.		
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/rev 			
			 Air mass during diagnosis not calibrated mg/rev 			

MAF per cylinder dispression of diagnosis 40.0 – 130.0 kg/h MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/rev Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated will always a controller output conditions: Dynamic air mass 25.01 mg/rev Dynamic air mass after dynamic conditions are fulfilled > 20.0 g Evap purge conditions are fulfilled > 20.0 g Evap purge conditions: Case 1 Evap purge low not calibrated Evap purge flow not calibrated Evap purge flow not calibrated Evap purge flow not calibrated Case 3 Canister load not calibrated Evap purge flow not calibrated	@ start of diagno- sis 40.0 – 130.0 kg/h
	during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/rev Engine load not Accelerator pedal value not calibrated so Low dynamic conditions: Dynamic air mass < 25.01 mg/rev Dynamic air mass < 25.01 mg/rev Dynamic laimbad controller output < 20.0% Integrated air mass after dynamic conditions are fulfilled > 20.0 g Evap purge conditions Case 1 □ Evap purge flow not calibrated Evap purge flow

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Close the gap conditions:			
			 O2S rear voltage @ diagnosis start >= 0.55 V 			
			 Integrated air mass @ start di- agnosis not cali- brated g 			
			 O2S front dynamic diagnosis separate not active 	unikswagen AG	.VolkswagenAG	loes no .



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Lambda adaption not active			
			 Valve lift not equipped 			
			 Number of checks 2.0 [-] 			
			 Temperature conditions: 			
			~~ Signal (tmot) > 60° C			
			 ~~ Signal (tans) > -48° C 			
			Modeled catalyst temperature once after engine start > 550° C AG. Voll	(swagen AG d		
) est 2 11th	Modeled catalyst temperature @ start of diagnosis 500 – 700° C	3 40	es not guarantee or a	k.
		Poloemiilou	 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 			TO AND HIS MILES
		oart orin whole, is	 Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g 			n respect to the co
		ercial purposes, in	 Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K 			rrectness of inform
		Copyright of the state of commercial purposes, in part or in whole, is not be mile of the state of commercial purposes, in part or in whole, is not be mile of the state of th	 ~~ Signal (tmot) > 60° C ~~ Signal (tans) > -48° C Modeled catalyst temperature once after engine start > 550° C Modeled catalyst temperature @ start of diagnosis 500 - 700° C Modeled catalyst temperature during diagnosis 470 - 730° C Integrated air mass, catalyst temp. conditions fulfilled not calibrated g Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 - 254.0 K Diff. between dynamic and stationary catalyst temperature during diagnosis -304.0 - 304.0 K Modeled EGT @ Q2S rear <= 	1		ation in this of the state of t
		°0;	Modeled EGT @ 02S rear <= 1,201°, C	D sole was	межно Мацій, при Лонген	
			Air mass conditions:	. ĐA nasa		
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/rev 			
			 Air mass during diagnosis not calibrated mg/rev 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h MAF per cylinder 			
			during diagnosis 35.0 – 135.0 kg/h			
			Load conditions:			
			 Air mass set point 125.01 – 580.0 mg/rev 			
			 Engine load not calibrated % 			
			 Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated s 	kswagen AG do	esnot guarar	
		dess auth	For time not cali- brated s		antee or d	Co.
			Low dynamic conditions:			Ořan III
		g, is not by	Dynamic engine speed < 20 RPM			lity with re
		orin who _{th}	 Dynamic air mass < 25.01 mg/ rev 			spect to the
		es, in part	 Dynamic lambda controller output < 20.0% 			ne correcti
		Copyright of the state of the s	 Integrated air mass after dy- namic conditions are fulfilled > 20.0 g 			contamiliability with respect to the correctness of information in this order.
		Wale Of Co	 Evap purge con- ditions: 			ninthis
		4010101	Case 1			Solitor
		41/10/03	Evap purge valve not calibrated	9	Copyright by Volksw	×
			• Case 2	30,1196	MSXION NY.	
			not calibrated Case 2 Canister load calculation not calibrated	.ĐA go.,		
			Evap purge flow not calibrated			
			• Case 3			
			Canister load not calibrated [-]			
			Evap purge flow not calibrated			

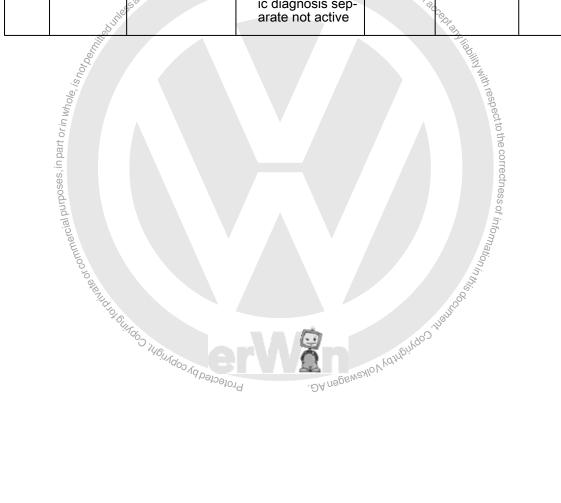
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions		MIL Illumina- tion	Component Diagnostic Procedure
		a dilligating se authorise	 Close the gap conditions: O2S rear voltage @ diagnosis start >= 0.55 V AG. Volksw Integrated air mass @ start diagnosis not calibrated g O2S front dynamic diagnosis separate not active 	agen AG does n	ot guarantee or accept	and lideliii
		Control of the part of the par	Close the gap conditions: O2S rear voltage @ diagnosis start >= 0.55 V AG. Volksw Integrated air mass @ start diagnosis not calibrated g O2S front dynamic diagnosis separate not active	.DA nagewey	lo V Vo My bir 400 jiran	ith respect to the correctness of $information$ in this $coc_{Q_{ij}}$

Description Old Value Conditions Length dure	DTC /	Monitor	Malfunction Cri-	Secondary Parame-	Monitoring	MIL Illumina-	Component Di-
E CO2 O2 O32 Sensors CO2 O32 Sensors CO3 O33 Sensors CO3 De- Iayed Re- spons spons spons polarly Ibank 1 Sensors CO2 Re- spons spons polarly Ibank 1 Sensors CO3 Sensors CO4 Re- spons spons polarly Ibank 1 Sensors CO4 Sensors CO5 Re- spons spons polarly Ibank 1 Sensors CO5 Sensors CO7 Re- Re- spons polarly Ibank 1 Sensors CO7 Sensors CO7 Sensors CO7 Sensors CO7 Sensors CO7 Converter GX7 Refer Ibank 1 Sensors CO8 Converter GX7 Refer Ibank 1 Sensors CO9 Sensors CO7 Converter GX7 Refer Ibank 1 Sensors CO9 Sensors CO7 Converter GX7 Refer Ibank 1 Sensors CO7 Sensors CO7 Converter GX7 Refer Ibank 1 Sensors CO9 Sensors CO7 Converter GX7 Refer Ibank 1 Sensors CO8 Converter GX7 Refer Ibank 1 Sensors CO9 Sensors CO7 Converter GX7. Check- ing. Internal resist- ance O2S rear ead O2S front ready Internal resist- ance O2S rear = 700.0 Ω Internal resist- ance O2S rear Integrated heat energy >= 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image after engine start > 230.0 = 1,600.0 = 3,000.0 kJ Image afte	scrip-	Description				tion	
of secondary fuel control loop < 0.25 [-]	P013 E O2 Sen-sor De-layed Reposse e Rich to Lean Sen Sen Sen Sen Sen Sen Sen Sen Sen Se	Oxygen Sensors (O2S) Rear Rich To Lean Transition De- layed Re- sponse Monitoring, Delay Measure- ment	Sensor signal delay time > 0.9 s (arithmetic average) AG. Volkswagen AG.	 General conditions Vehicle speed >= 10 km/h BARO not calibrated kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s Engine speed 1,344 - 3,008 RPM Lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller output during diagnosis < 8.0 - 15.0% Fast trim control not calibrated Proportional part of secondary fuel control loop < 	• 86.5 s • Once / DCY	• 2 DCY (NAR)	Check the
Coasting function not active	1			not active			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
		horisedby	Lambda adaption not active	not gu	arante.	
		unlessauth	 Valve lift not equipped 		Oraccep,	
		osimite o	Number of checks 2.0 [-]		877 [8]	
	16,18,00		Temperature conditions:			With res
	or in who		 ~~ Signal (tmot) > 60° C 			specttot
	in part o		 ~~ Signal (tans) > -48° C 			hecorre
	cialpurposes	old Value	 Modeled catalyst temperature once after engine start > 550° C 			otness of info
	Jammer.	o to one	 Modeled catalyst temperature @ start of diagnosis 500 – 700° C 		1160	mationin
		indro Billidos ingines	 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 		Montgo, irania, copring,	
		.000/	temperature @ start of diagnosis 500 – 700° C Modeled catalyst temperature dur- ing diagnosis 470 – 730° C Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g	Anspawaylovy	A Tante of a Captan, library	
			 Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K 			
			 Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K 			
			 Modeled EGT @ O2S rear <= 1,201° C 			
			 Air mass conditions: 			
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/rev 			
			 Air mass during diagnosis not calibrated mg/rev 			

		55			9°C	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	rin whole, is	Second State of State	 MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h 		Q.M.R.M.do.O. Tuburnoo.	ith respect to
	ss, in part o		 MAF per cylinder during diagnosis 35.0 – 135.0 kg/h 			the correct
	rpose		Load conditions:			ness
	mercial pul		 Air mass set point 125.01 – 580.0 mg/rev 			of informa
	ç	Take of con-	Engine load not calibrated %		å	tioninthi
		WHO ON SALES	 Accelerator pedal value not calibra- ted % 		Cillantook	
		14611Ados	• For time not call brated s	DA nagswaxlo V _t	QIUBINDO 3	
				A napper.		
			 Dynamic engine speed < 20 RPM 			
			 Dynamic air mass < 25.01 mg/ rev 			
			 Dynamic lambda controller output < 20.0% 			
			 Integrated air mass after dy- namic conditions are fulfilled > 20.0 g 			
			 Evap purge con- ditions: 			
			• Case 1			
			 Evap purge valve not calibrated 			
			• Case 2			
			 Canister load cal- culation not cali- brated 			
			 Evap purge flow not calibrated 			
			• Case 3			
			Canister load not calibrated [-]			
			 Evap purge flow not calibrated 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Close the gap conditions:			
			O2S rear voltage @ diagnosis start >= 0.55 V			
		edpy Volkewage	 Integrated air mass @ start diagnosis not calies brated g O2S front dynamic diagnosis sep- 	loi gu _{ar}		
	dune	sauthorised by Volkswage	O2S front dynamic diagnosis separate not active	ante Orac	Copp.	



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P013 F	Oxygen Sensors	Sensor signal delay time >	General conditions	• 86.5 s • Once /	• 2 DCY (NAR)	- Check the Oxygen Sen-
	(O2S) Rear Lean To Rich Transi-	0.9 s (arith- metic aver- age)	 Vehicle speed >= 10 km/h 	DCY		sor 1 After Catalytic Converter -
	tion De- layed Re- sponse		BARO not cali- brated kPa			GX7 Refer to ⇒ "3.6.25
spons e - Lean	Monitoring, Delay Measure-		 Catalyst over- heating protec- tion not active 			Oxygen Sensor 1 After Catalytic
to Rich Bank 1 Sen-	ment		 Turbine over- heating protec- tion not active 			Converter GX7, Check- ing", page 1149
sor 2			O2S rear ready			
			O2S heater rear active			
			O2S front ready			
			• Internal resist- ance O2S rear <= 700.0 Ω			
			 Time after a catalyst purge phase >= 0.02 s 			
			 Integrated heat energy >= 1,600.0 - 3,000.0 kJ 	Volkowo		
			Time after engine start > 230.0 - (000.0 s) Engine speed	voikswagen A	G does not guarante	00
		in the state of th	• Engine speed 1,344 – 3,008 RPM			or accept and lie
		Snotpon	 Lambda control value < 50.0% 		G does not guarante	POLITINA
		in part or in whole, is not be milling the purposes, in part or in whole, is not be milling the principal part or in whole, is not be milling the principal part or in whole, is not be milling the principal part or in whole, is not be milling the principal part or in whole, is not be milling the principal part or in whole, is not be milling the principal part or in whole, is not be milling the part or in whole, is not be milling the part or in whole, is not be milling the part or in whole, is not be milling the part or in whole, is not be milling the part or in whole, is not be milling the part or in whole, is not be milling the part of the part o	 Deviation of lambda controller output @ start di- agnosis < 10.0% 			Arespect to th
			Deviation of lambda controller output during di- agnosis < 8.0 – 15.0%			correctness of
		ımercial	Fast trim control not calibrated			informa
		Too page of con	Proportional part of secondary fuel control loop < 0.25 [-]			ton in this cook
		OU _M	Coasting function pot active	9	highby Volker	900 Ju

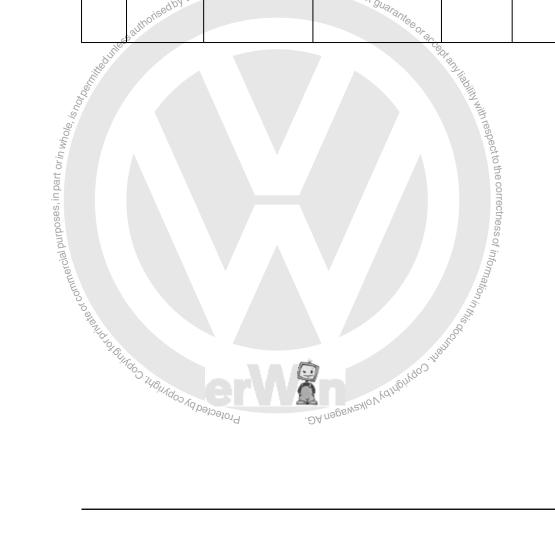
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Lambda adaption not active			
			 Valve lift not equipped 			
			 Number of checks 2.0 [-] 			
			Temperature conditions:			
			 ~~ Signal (tmot) > 60° C 			
			 ~~ Signal (tans) > -48° C 			
			 Modeled catalyst temperature once after engine start > 550° C 			
			 Modeled catalyst temperature @ start of diagnosis 500 – 700° C 			
			 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 			
		odinoriseatov	 Ing diagnosis 470 – 730° C Integrated air mass, catalyst age temp. conditions fulfilled not calibrated g Diff. between dynamic and stationary catalyst 	n AG does not go	larantee or	
	.4	Septiment of the septim	 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 K 		* &C.C. Py and L. T.	A Hilly Willis
	s, in part or in whole	in 60 to a British of Buildon of the state o	 Diff. between dynamic and stationary catalyst temperature during diagnosis 304.0 – 304.0 K 			with respect to the correctness of information in the
	cial purpose		 Modeled EGT @ O2S rear <= 1,201° C 			tness of info
	ner of the state o		 Air mass conditions: 			^{hrmation}
		To agend to Cill	Air mass @ start of diagnosis 125.01 – 580.0 mg/rev		ilialitoo	10 th.
		JABINADO	Air mass during diagnosis not calibrated mg/rev. Agents Agents	NOWENESS	athuringo,	

			I <u> </u>	- 40Y Jolkswa		GUIAG does not
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Di- agnostic Proce- dure
			MAF per cylinder @ start of diagnosis 40 0 – 130.0 kg/h			
			MAF per cylinder during diagnosis 35 0 – 135.0 kg/h			
			Load conditions:			
			• Air mass set point 125.01 – 580.0 mg/rev			
			Engine load not calibrated %			
			Accelerator pedal value not calibra- ted %			
			For time not calibrated s			
			Low dynamic conditions:	ADINADO VA BOSTOR		-DA negswealo V Vo rhp
			Dynamic engine speed < 20 RPM	ONG POLOG	lo19	.DA Nagen AG.
			Dynamic air mass < 25.01 mg/ rev			
			Dynamic lambda controller output < 20.0%			
			Integrated air mass after dy- namic conditions are fulfilled > 20.0 g			
			Evap purge con- ditions:			
			• Case 1			
			Evap purge valve not calibrated			
			• Case 2			
			Canister load cal- culation not cali- brated			
			Evap purge flow not calibrated			
			• Case 3			
			Canister load not calibrated [-]			
			Evap purge flow not calibrated			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
			Close the gap conditions:				
			O2S rear voltage @ diagnosis start >= 0.55 V				
			 Integrated air mass @ start di- agnosis not cali- brated g O2S front dynamic diagnosis sep- arate not active 	. Volkswagen A	G. Volkswagen A	adoes not	
			O2S front dynamic diagnosis separate not active			Suarantee or au	C _O D _T
P0140 O2 Sensor Circuit No Activity De-	Oxygen Sensors (O2S) Rear Open Cir- cuit	• Internal resistance of O2S (binary) > 65,534.0 Ω	in whole, is not bermilling	2.5 sContinuous	• 2 DCY (NAR)	- Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25	of the milital with respect to the correctness of information in this occurrence of the correctness of the correc
tected Bank 1 Sen- sor 2			reial purposes, in part or in whole, is not bennies			Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149) the correctness of info
P0141 O2 Sen- sor Heat- er Cir- cuit	Sensors (O2S) Heat- er Rear Out Of Range	• Internal resistance of O2S (binary) 700.0 – 65,534.0 Ω	manded on	• 20.0 s • Once / DCY	• 2 DCY (NAR)		mation in this country.
Bank 1 Sen- sor 2			• Fortime >= 10.0 s	Protected by co	.9Ar	⇒ "3.6.25 Oxygen Sensor 1 After Setallytic Converter GX7, Checking", page 1149.	
Fuel Tim-	Fuel Injection Valves Out Of	Boost voltage < 30.0 V	• Engine running >= 0.3 s	• 3.6 s • Contin-	• 2 DCY (NAR)	Check the Fuel Injectors . Refer to	
ing Er- ror		• Boost voltage <= 50.0 V		uous		⇒ "3.6.14 Fuel Injec- tors , Check-	
	Fuel Injec- tion Valves Out Of Range High	• Boost voltage > 75.0 V				<u>ing",</u> page 1127 .	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0171 Sys- tem Too	Fuel Sys- tem Too Lean	Lambda con- troller output > 35.0%	Lambda control closed loopAir mass > 60.00	• 60.0 s • Continuous	• 2 DCY (NAR)	Check vac- uum lines visually for leaks.
Lean Bank 1			mg/rev • Engine speed > 576 RPM			Check the intake system visually for
			 ECT @ cylinder block > 60° C IAT @ manifold > 	uagen AG. Vo	kswagen A G do	leaks (false air). - Check the
			 IAT @ manifold > -48° C AAT > -48° C Evap purge valve 	§Wa9€	3 does	fer to fuel
			closed • Canister load <= 1.20 [-]		7	system me- chanical test- ing in ⇒ "3.1 Pre-
		whole.	1.20 [-] Evap purge flow at max. value Depending on	g on urge it of		⇒ "3.1 Pre- liminary Check", page 13 and/ or to appro- priate repair
		s, inpart orin	canister purge min: • Lower limit of lambda controller			manual. - Check the Fuel Pres-
		Depending on canister purge min: Lower limit of lambda controller output n.a. Upper limit of lambda controller output n.a. Evap purge flow at min. value			sure Sensor - G247 Re- fer to ⇒ "3.6.16	
						Fuel Pressure Sensor G247, Checking", page 1131
			TO BUILDOD WELL TO THE	_{ejso} eio1 ^q	.ĐA nageny	- Check the Fuel Injectors Refer to Fuel Injectors Check-
						<u>ing",</u> page 1127 .
						- Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer
						to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Check-
						ing", page 1149.

- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 - Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter - GX10 - Refer to catalytic Converter GX10 - Checking", page 1152 . - Check the Fuel Delivery Unit - GX1 - Fuel Pump Control Module - J538 - Refer to catalytic Converter GX10 - Checking", page 1152 . - Check the Fuel Delivery Unit - GX1 - Fuel Pump Control Module - J538 - Refer to catalytic Converter GX10 - The pump Control Module - J538 - Refer to catalytic Converter GX10 - The pump Control Module J538 - Testing", page 1125 .	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
page 1125.		outhorised by Volk	_{SW} agen AG. Volkswage,	n AG does not guarantee or			Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152. - Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing",



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0172 Sys- tem Too	Fuel Sys- tem Too Rich	• Lambda con- troller output < -35.0%	 Lambda control closed loop Air mass > 60.00 	• 60.0 s • Continuous	• 2 DCY (NAR)	 Check the fuel pressure and delivery quantity. Re-
Rich Bank 1			mg/rev • Engine speed > 576 RPM			fer to fuel system me- chanical test- ing in ⇒ "3.1 Pre-
			 ECT @ cylinder block > 60° C IAT @ manifold > 			liminary Check", page 13 and/
			-48° Č • AAT > -48° C			or to appro- priate repair manual.
			Oil dilution not detected			Check the
			Evap purge valve closed			Fuel Pres- sure Sensor - G247 Re-
			• Canister load <= 1.20 [-]			fer to ⇒ "3.6.16 <u>Fuel Pres-</u>
	onmmercial purposes, in part or in whole, is not being the manage of commercial purposes, in part or in whole, is not being the second of the commercial purposes.		Evap purge flow at max. value		accept and liebility	sure Sensor G247 , Checking",
		oologiited Hees authorised by Volkswad	Depending on canister purge sen Amin elkswagen AG doo			page 1131 . - Check the
			Lower limit of lambda controller output n.a.			Fuel Injec- tors . Refer to ⇒ "3.6.14 Fuel Injec-
			 Upper limit of lambda controller output n.a. 			tors , Check- ing", page 1127 .
			Evap purge flow at min. value		Nwith respect to the o	- Check the Oxygen Sen- sor 1 Before Catalytic Converter - GX10 Re- fer to
					orrectness <i>of information i</i> ,	⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
	O O O O O O O O O O O O O O O O O O O	Rujidoo jubijaja	DA nagan	S NO NG HE MOKE	Nwith respect to the correctness of information in this occurrence.	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Pous Pies - Regulaton 1 Condition	Fuel Pressure (LP) Sensor Short To Battery / Open Circuit	• High fuel pressure sensor voltage > 4.80 V	Ikswagen AG does not guaran	• 2.0 s • Continuous	DCY DCY 2 NAR) • On the correctness of information	ule J538, Testing", page 1125. Check the Intake Manifold Sensor - GX9- Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. Check the EVAP Canister Purge Regulator Valve 1 - N80- Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. Check the Fuel Pressure Sensor G247- Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131. Check the Fuel Pressure Regulating Valve N276- Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve N276- Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0191 Fuel Rail Pressure Sensor Circuit Rang e/Perfor- manc	Fuel Rail Pressure (FRP) Out Of Range High	• Fuel pressure > 27,900.09 kPa	 Engine running Engine speed < 8,160 RPM Time after engine start > 5.0 s 	5.0 sContinuous	• 2 DCY (NAR)	- Check the Fuel Pressure Sensor- G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131.
e Bank 1						- Check the Fuel Pres- sure Regu- lating Valve - N276 Refer to
						⇒ "3.6.15 Fuel Pres- sure Regula- tor Valve N276 . Checking", page 1129 .
P0192 Fuel Rail Pres- sure Sen-	Fuel Pressure (LP) Sensor Short To Ground	High fuel pressure sensor voltage < 0.20 V	• Engine stop not	 2.0 s Continuous 	• 2 DCY (NAR)	- Check the Fuel Pres- sure Sensor - G247 Re- fer to ⇒ "3.6.16 Fuel Pres-
Circuit Low Bank 1		ses authorised by		ovaranjee o _{re}	CCBDIANA NO.	sure Sensor G247, Checking", page 1131.
	or in whole, is not be,				olikywith respect to t	- Check the Fuel Pres- sure Regu- lating Valve - N276 Refer to ⇒ "3.6.15
	Apurposes, inpart o				$y_{ m with}$ respect to the correctness of i	Fuel Pres- sure Regula- tor Valve N276, Checking", page 1129
der 1 Injec- tor "A"	tionsyaives	for open cir-	active	L CRK	• 2 DCY (NAR)	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injector-
Circuit	9401046	cuit via power stage diagnosis detected Injector low side voltage < 2.0 V	 Engine speed < 7,000 RPM Injection time not calibrated s 	MoVer My Volk	, in the state of	tors , Check- ing", page 1127 .
		rectedby	DA nageny	57/,		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injection Valves Short Circuit	 Fault pattern for short cir- cuit via power stage diagno- sis detected Injector cur- rent rise time during peak phase < 0.064 ms 				



		1	oliged D)	ı		SUAPANY.
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running			80
		• Injector low side voltage < 2.0 V				
		Injector low side switch current driver stage internal value				
		Injector low side voltage < 2.0 V				The Miss
		Injector high side switch current driver stage internal value	REALING OF SHEINGOONG PORT	erV		NAMBINDO instructor
		• Injector low side voltage < 2.0 V	³ 19paj _€	⁹¹⁰¹ d	.DA nageway!	, , , , , , , , , , , , , , , , , , ,
		Injector low side switch current (hard- ware values) driver stage internal value				
		• Injector volt- age < 2.0 V				
		Injector low side switch current driver stage internal value				
		Injector volt- age < 2.0 V				
		Injector low side switch current (hard- ware values) driver stage internal value				
		• Injector load resistance to ground and battery > 20.0 Ω				
		Injector low side switch current driver stage internal value				

Nolkswagen AG. Volkswagen AG does no

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current driver stage internal value 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 			
	Fuel Injection Valves Open Circuit	Fault pattern for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not 	8,640.0° CRK olkswagen AG Continuous	• 2 DCY (NAR)	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 .
	Fuel Injection Valves Short Circuit	Fault pattern for short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms	calibrated s			ability with respect to the correctness o
		Party Marie or commercial puri	Protected by copyright; Co	-ĐA na	бемежо Лоцкем в д	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking". Page 1127. Page 1127.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion AG. Volkswagen	Component Diagnostic Procedure
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running The state of the sta	Pohyo		of gualantee of
		Injector low side voltage < 2.0 V	is not too s			
		Injector low side switch current driver stage internal value	npart or in who _{le,}			
		Injector low side voltage < 2.0 V	purposes, ii			
		Injector high side switch current driver stage internal value	te or commercial l			
		• Injector low side voltage < 2.0 V	Salid to the Contraction of the			
		Injector low side switch current (hard- ware values) driver stage internal value	• Engine running in the season of the season	orotected by cop	AG.	obyright by Volkswagen
		• Injector volt- age < 2.0 V				
		Injector low side switch current driver stage internal value				
		Injector volt- age < 2.0 V				
		Injector low side switch current (hard- ware values) driver stage internal value				
		• Injector load resistance to ground and battery > 20.0				
		Injector low side switch current driver stage internal value				

DTC / Monitor De- scrip- tion Strategy Description	trategy teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	 Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current driver stage internal value 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	0.040.00	9 D OV	
P0203 Cylinder 3 Injector "A" Circuit Fuel Injector "A" Circuit Fuel Injection Valves Short Circuit Publicado Tuburdoo Agpapa	for open circuit via power stage diagnosis detected injector low side voltage < 2.0 V Fault pattern for short circuit via power stage diagnosis detected injector low side voltage < 2.0 V	Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s. Company of the company of t	8,640.0° CRK Continuous - Respect to the correctness of information in the continuous - Respect to the correctness of information in the correctness of information i	(NAR)	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

Fuel Injectical Error Injector low side voltage < 2.0 V	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
side voltage < 2.0 V Injector low side switch current driver stage internal value Injector low side voltage < 2.0 V Injector low side switch current (hardware values) driver stage internal value Injector voltage < 2.0 V Injector low side switch current driver stage internal value Injector voltage < 2.0 V Injector low side switch current driver stage internal value Injector voltage < 2.0 V Injector low side switch current (hardware values) driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value		tion Valves Electrical	fault pattern via power stage diagno-	Engine running			
side switch current driver stage internal value • Injector low side voltage < 2.0 V • Injector low side switch current driver stage internal value • Injector low side switch current (hard- ware values) driver stage internal value • Injector low side switch current driver stage internal value • Injector volt- age < 2.0 V • Injector low side switch current driver stage internal value • Injector volt- age < 2.0 V • Injector volt- age < 2.0 V • Injector low side switch current driver stage internal value • Injector volt- age < 2.0 V • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector volt- age < 2.0 V • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value • Injector volt- age < 2.0 V • Injector low side switch current driver stage internal value • Injector volt- age < 2.0 V • Injector volt- age < 2.0 V • Injector low side switch current driver stage internal value • Injector volt- age < 2.0 V • Injector volt- age < 2.0 V			side voltage <				
side voltage < 2.0 V Injector high side switch current driver stage internal value Injector low side voltage < 2.0 V Injector low side switch current (hardware values) driver stage internal value Injector voltage < 2.0 V Injector voltage < 2.0 V Injector voltage < 2.0 V Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value			side switch current driver stage internal				
side switch current driver stage internal value Injector low side voltage < 2.0 V Injector low side switch current (hardware values) driver stage internal value Injector voltage < 2.0 V Injector low side switch current driver stage internal value Injector voltage < 2.0 V Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value internal			side voltage <				
Injector low side switch current (hardware values) driver stage internal value Injector voltage < 2.0 V Injector low side switch current driver stage internal value Injector voltage < 2.0 V Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector load resistance to ground and battery > 20.0 Ω Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value			Injector high side switch current driver stage internal value				
Injector low side switch current (hardware values) driver stage internal value Injector voltage < 2.0 V Injector low side switch current driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value			• Injector low side voltage < 2.0 V				
 Injector low side switch current driver stage internal value Injector low side switch current driver stage internal value Injector low side switch current (hardware values) driver stage internal value Injector load resistance to ground and battery > 20.0 Ω Injector low side switch current driver stage internal value 			Injector low side switch current (hard- ware values) driver stage internal value	ed by Volkswagen AG. Vo	lkswagen AG d	Pes not guara	
 Injector low side switch current driver stage internal value Injector voltage < 2.0 V Injector low side switch current (hardware values) driver stage internal value Injector load resistance to ground and battery > 20.0 Ω Injector low side switch current driver stage internal value 			• Injector volt- age < 2.0 V	Out		Witee Or	C _C
 Injector voltage < 2.0 V Injector low side switch current (hardware values) driver stage internal value Injector load resistance to ground and battery > 20.0 Ω Injector low side switch current driver stage internal value 			Injector low side switch current driver stage internal value				Carry liability with re
 Injector low side switch current (hardware values) driver stage internal value Injector load resistance to ground and battery > 20.0 Ω Injector low side switch current driver stage internal value 			Injector volt- age < 2.0 V			, ,	spect to
• Injector load resistance to ground and battery > 20.0 Ω • Injector low side switch current driver stage internal value • Injector low side switch current driver stage internal value			Injector low side switch current (hardware values) driver stage internal value				the correctness of i
Injector low side switch current driver, stage internal value Injector low side switch			Injector load resistance to ground and battery > 20.0 Ω				nformation in this o
'VA			Injector low side switch current driver stage internal value	346 _U Adoo Ago	00	CMO V VOITIBILIDA	, lentos

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	 Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current driver stage internal value 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 			
P0204 Cylinder 4 Injector "A" Circuit Fuel Injection Valves Open Circuit Fuel Injection Valves Short Circuit	cuit via power stage diagno- sis detected Injector low side voltage < 2.0 V	Engine stop not active SwECTA@ cylinder block >= 30° C Engine speed < 7,000 RPM Injection time not calibrated s	8,640.0° CRK Continuous **Resolution Report Repo	(NAR)	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time (SW) Length	MIL dlumina- tion	Component Diagnostic, Procedure
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running			
		• Injector low side voltage < 2.0 V	whole, is n			
		Injector low side switch current driver stage internal value	Engine running Engine running In part or in whole, is not on the part of in part or in part or in whole, is not on the part of in part or i			Component Diagnostic, Procedure Gure
		• Injector low side voltage < 2.0 V	nercial purp			
		Injector high side switch current driver stage internal value	Imos to alguid to to			
		• Injector low side voltage < 2.0 V	THEOD,	H6iHAdoo Ac	erW	and Mary D
		Injector low side switch current (hard- ware values) driver stage internal value		. (9,Də _{],Ə,}	_{NO1} A	. DA naggen A.G.
		• Injector volt- age < 2.0 V				
		Injector low side switch current driver stage internal value				
		Injector volt- age < 2.0 V				
		Injector low side switch current (hard- ware values) driver stage internal value				
		• Injector load resistance to ground and battery > 20.0 Ω				
		Injector low side switch current driver stage internal value				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current driver stage internal value 	ECT @ cylinder block >= -30° C. Engine speed < 7,000 RPM Injection time not calibrated s	Volkswagen A C	does not guarante,	oraccap _{rathlish}
Throt- tle/	Throttle Position Sensor (TPS) 2 Rationality Check	Normalised difference between measured and modeled value of mass air flow from TPS 2 = 1.0 [-] Relative mass air from TPS 2 > 60.0 [-]	Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) not active Throttle adaptation (# initial start or after detection of throttle exchange or checksum error) not active	• 0.01 s • Continuous	• 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169
P0222 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "B" Circuit Low	sition Sen- sor (TPS) 2 Short To Ground	Throttle position sensor 2 voltage < 0.17 V	Protected by copyright, Co	• 0.2 s • Continuous	• 2 DCY (NAR)	- Check the Throttle
P0223 Throttle/ Pedal Position Sensor/ Switc h "B" Circuit High	sor (TPS) 2 Short To Battery Plus	Throttle position sensor 2 voltage > 4.83 V		0.2 sContinuous	• 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P0234 Tur- bo- charg- er/Su- per- charg- er "A" Over- boost Con- dition		Boost pressure > calculated max. plausible value Boost pressure deviation < 209.90 – 265.0 kPa Turbocharger protection active	 Engine running Accelerator pedal value > 0.0% Fuel cut off n.a. Difference between boost pressure and barometric pressure >= 20.0 kPa 	uous	• 2 DCY (NAR)	page 1110.	3 or acceptant liability with ter-
P0236 Tur- bo- charg- er/Su- per- charg- er Boost Sen- sor "A" Circuit Rang e/Per- for- manc e	Sensor Engine Standing: Cross Check	 Diff. turbo-charger boost pressure vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa Diff. BARO vs. MAP <= 7.50 kPa 	 Gase 1: engine stop during DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle n.a. For time >= 10.0 s Case 2: engine stop @ start of DCY 	• 3.0 s • Continuous	• 2 DCY (NAR)	- Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31 Checking", page 1115 - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113	Staccept and liadilly with 16.7

			- 1/ 11			
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length		Component Diagnostic Procedure
	Turbo- charger (TC) Boost Pressure Sensor ECM Keep Alive-Time: Cross Check Turbo-		 Engine stopped Vehicle speed < 1 km/h ECM keep alivetime 10.0 – 6,553.5 s Time after engine stop >= 5.0 s BARO sensor voltage 0.20 – 4.80 V MAP sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V 		Sept ^{any} liability with respect to the correctness of information in this septiany liability with respect to the correctness of information in this septiany liability with respect to the correctness of information in this septiany liability with respect to the correctness of information in this septiany liability with respect to the correctness of information in this septiany.	
P0237 Tur- bo- charg- er/Su- per- charg- er Boost Sen- sor "A" Circuit Low	charger (TC) Boost	Turbocharger boost pres- boost pres- voltage < 0.20 V	Nagen AG. Pro	O.5 s Continuous, do SHION AGAMONTO SHION AG	• 2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0238 Tur- bo- charg- er/Su- per- charg- er Boost Sen- sor "A" Circuit	Turbo- charger (TC) Boost Pressure Sensor Short To Battery Plus	Turbocharger boost pres- sure sensor voltage > 4.80 V		• 0.5 s • Continuous	• 2 DCY (NAR)	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115.
High		Billusotou,	nessauthorised by Volkewagen	AG. Volkswage	n AG does not gu _{al}	- Check the Actuator - V465 Refer to ⇒*3.6.7 Charge Air Pressure Ac- tuator V465, Checking page 1113
P025 A Fuel Pump Mod- ule "A" Con- trol Cir- cuit/ Open	Fuel Pump (FP) Open Circuit	Signal voltage lower range > 1.92 - 2.21 V Signal voltage upper range (hardware values) \$ 2.84 - 3.25 V	PWM 9.80 – 92.20%	• 0.5 s • Continuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- Fuel Pump Control Module - J538- Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125.
P025 C Fuel Pump Mod- ule "A" Con- trol Circuit Low	Fuel Pump (FP) Short To Ground	Signal voltage < 1.92 – 2.21 V (hardware values)	Commanded PWM 9.80 – 92.20% Fuel pump commanded off	• 0.5 s • Continuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P025 D Fuel Pump Mod- ule "A" Con- trol Circuit High	Fuel Pump (FP) Short To Battery Plus	Power stage temperature > 160.0 – 200.0° C Signal current (hardware values) driver stage internal value	Commanded PWM 9.80 – 92.20% Tuel pump commanded on snot	• 0.5 s • Continuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
P0261 Cvlin-	Fuel Injection Valves Short To Ground Injection Valves Short To Ground (Low Side)	 Fault pattern for short to ground via power stage diagnosis detected Injector voltage < 2.0 V Injector driver voltage < 2.0 V Injector driver driver switch current driver stage sinternal value 	Liigine Stop not	0,040.0	• 2 N the correctness of information in this co.	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
	Fuel Injection Valves Short To Ground (High Side)	 Injector driver low side switch current driver stage internal value (hardware values) Injector driver voltage < 2.0 V Injector driver high side switch current driver stage internal value (hardware values) 	. DA nagswallov			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cylin-	Fuel Injec- tion Valves Short To Battery Plus	 Fault pattern for short to battery plus via power stage diagno- sis detected Injector volt- age > 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.0° CRK Continuous	• 2 DCY (NAR)	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
	Injection Valves Short To Battery Plus (Low Side)	 Injector driver voltage > 2.0 V Injector driver low side switch current driver stage internal value (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	720° CRK Continuous		
	Injection Valves Short To Battery Plus (High Side)	 Injector driver voltage > 2.0 V Injector driver high side switch current driver stage internal value (hardware values) 	, Volkswagen AG. V	Volkswagen A.G	does ₁₇₀₄	
Cylin- der 2	Fuel Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis detected Injector voltage 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.0° CRK Continuous	• 2 DCY	tors . Refer to 3.6.14 Fuel Injectors, Checking",
	Injection Valves Short To Ground (Low Side)	Injector driver voltage < 2.0 V Injector driver high side switch current driver stage internal value Injector driver low side switch current driver stage internal value (hardware values)	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	• 720° CRK • Continuous	, , d	page 1127 I the correctness of information in this document.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injection Valves Short To Ground (High Side)	Injector driver high side switch current driver stage internal value (hardware values)	₈ dby Volkswa gen A.G. Volksv	does	not guarantee or accep	Ranylidollin with resp
P0265 Cylin- der 2 Injec- tor "A" Circuit High	Fuel Injection Valves Short To Battery Plus Injection	Fault pattern for short to battery plus via power stage diagnosis detected Injector voltage > 2.0 V Injector driver	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s Engine running 	CRK Continuous	(NAR)	Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors . Checking", 8
	Valves Short To Battery Plus (Low Side)	 Injector driver low side switch current driver stage internal value (hardware values) 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Onjection time not calibrated ms 	. Coutiunous Cuk	MOV KUMBIYGOD ing	page 1127.
	Injection Valves Short To Battery Plus (High Side)	 Injector driver voltage > 2.0 V Injector driver high side switch current driver stage internal value (hardware values) 				
P0267 Cylinder 3 Injector "A" Circuit Low	Fuel Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis de- tected Injector volt- age < 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	 8,640.0° CRK Continuous 	• 2 DCY (NAR)	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Short To Ground (Low Side)	 Injector driver voltage < 2.0 V Injector driver high side switch current driver stage internal value Injector driver low side switch current driver stage internal value (hardware values) 	• ECT @ cylinder block >= -30° C • Engine speed <	• 720° CRK • Continuous		
	Fuel Injection Valves Short To Ground (High Side)	Injector driver voltage < 2.0 V Injector driver high side switch current driver stage internal value (hardware values)	aless authorised by Volks	_W agen AG. Voll	sswagen AG does i	ot guarantee or acce
Cylin-	Fuel Injection Valves Short To Battery Plus	 Fault pattern for short to battery plus via power stage diagnosis detected Injector voltage > 2.0 ½ 	• Engine stop not active • ECT @ cylinder	8,640.0° CRK Continuous	• 2 DCY (NAR)	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking",
	Injection Valves Short To Battery Plus (Low Side)	low side switch current	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM 	720° CRKContinuous		NOV to Meingo Jagandos
	Injection Valves Short To Battery Plus (High Side)	 Injector driver voltage > 2.0 V Injector driver high side switch current driver stage internal value (hardware values) 	Injection time not calibrated ms	pojo19	-DA negswe	MOV WATHERINGO J.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0270 Cylinder 4 Injector "A" Circuit Low	Fuel Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis de- tected Injector volt- age < 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.0° CRKContinuous	• 2 DCY (NAR)	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
	Injection Valves Short To Ground (Low Side)	 Injector driver voltage < 2.0 V Injector driver high side switch current driver stage internal value Injector driver low side switch current driver stage internal value (hardware values) 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	 720° CRK Continuous 		
	Fuel Injection Valves Short To Ground (High Side)	Injector driver voltage < 2.0 V Injector driver high side switch current driver stage internal value (hardware values)	G. Volkswagen AG does not	Auarantee or accept		
P0271 Cylinder 4 Injector "A" Circuite High	Injection Valves Short To Battery Plus Valves Short To Battery Plus (Low Side)	 Fault pattern for short to battery plus via power stage diagnosis detected Injector voltage > 2.0 V Injector driver voltage > 2.0 V Injector driver driver stage internal value (hardware values) 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	 8,640.0° CRK Continuous 720° CRK Continuous 	DCY DAR) Name of the correctness of information in this coo.	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
		Protected by copyrighs	101/kswagen AG.	(WIMBIN		posis and Toeting 4

tion	teria and Thresh- old Value	ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Injection Valves Short To Battery Plus (High Side)	 Injector driver voltage > 2.0 V Injector driver high side switch current driver stage internal value (hardware values) 				
P0299 Turbo- Tur- bo- charger er/Su- per- charg- er "A" Un- der- boost Con- dition	sure < calculated min. plausible value Boost pressure deviation > 5.0 kPa > 5.0 kPa	 Engine running Turbo charger bypass valve For time >= 1.0 s Pressure ratio before charger set point > 1.30 [-] For time >= 1.2 - 1.9 s Engine speed > 2,208 - 2,750 RPM Barometric pressure > 73.0 kPa ECT > -10° C No cylinder is shut off Fuel tank level not calibrated % 			- Check the Charge Air Pressure Sensor - G31 Refer to 3.6.8 Charge Air Pressure Sensor G31. Checking". page 1115. - Check the Actuator V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking". page 1113.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	1	econdary Parame- ters with Enable Conditions on AG. Volkswagen AG	Monitoring Time Length	MIL	Illumina- tion	Component Diagnostic Procedure
	Intake	Turbo charger	•	Engine running	• 0.01/s			
	Manifold Adaptive	actuator set point >= 18.0	•	Conditions:	 Contin- 	Orar		
	Value Check	21.0%		For time \geq = 0.5 s	uous		Copp	
	whole, is not belong.		•	For time >= 0.5 s Difference be- tween filtered boost pressure and basic boost pressure > 40.01 kPa Difference be- tween filtered boost pressure set point and ba- sic boost pres- sure > 40.01 kPa Boost pressure control deviation < 20.0 kPa Boost pressure set point < 16.0 kPa Actual boost pressure < 30.0 kPa Difference be- tween current boost pressure set point and ba- sic			Cantan liability with rest	o o o o o o
	urposes, in part or ir		•	Difference be- tween filtered boost pressure set point and ba- sic boost pres- sure > 40.01 kPa			omation in this och the state of the state o	to the correctness c
	ormnercial pl		•	Boost pressure control deviation < 20.0 kPa			Timation	of into
	o logical		•	Boost pressure set point < 16.0 kPa			ninthis 80 2	
		O O THOUS TO SEE		Actual boost pressure < 30.0 kPa	ano V Katrigi	Copy	John .	
		9,00), ₆ Cl	boost pressure set point and ba- sic boost pres- sure > 3.0 kPa	gsw≥ _{vi}			
			•	ECT > -20° C				
			•	IAT @ throttle > 0° C				
			•	Engine speed 2,500 – 6,800 RPM				
			•	Conditions:				
			•	For time >= 5,000.0 ms				
			•	Difference be- tween actual tur- bocharger speed and maximum turbocharger speed set point > 9,003 RPM				
			•	Conditions:				
			•	For time >= 1,000.0 ms				
			•	No gear shift				
			•	Fuel cut off not active				

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Ran- dom	Misfire Crankshaft Speed Fluc- tuation (Multiple)	Misfire Crankshaft Speed Fluctuation (Multiple) • Number of cylinders with emission threshold misfire within 4,000 revolu-	• 1,000 rev • Continuous	2 DCY (NAR)	Check the spark plugs visually for signs of foul- ing.	
der Mis- fire De-	tions >= 2.0 [-] The correctness Number of cylinders with	othe correctness	Check the intake system visually for leaks (false air).			
tected and prize a multiple and the commercial prize and the commercial	Soleward Childon into		Emission threshold misfire detected Service of the servi	D. M. Co. S.	ess of information in the	air). - Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. - Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair
						manual. - Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
						Check the Ig- nition Coils

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Number of cylinders with catalyst dam- aging misfire >= 2.0 [-]	Catalyst damag- ing misfire detec- ted	200 revContinuous	Immedi- ately (NAR)	with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output
		assauthorised by Vo	_{lik} swagen AG. Volkswag	DA nagsweallo V vo megante ou agent ante e ou	Cearan liabili		Stage , Checking", page 1133 .
s, inpart orin whole ;	John Ch.				Nwith respect to the correct		
mercialpurposes	16 or contin				aness of information in the		
	EMIH 10 J.C.	Alledo Holy doo ho	Protected A	-DA negswealo V vo Honvago	os in the state of		

			agen AG. Volkswagen	AGA	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cristeria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illumina Time tion Length	agnostic Proce- dure
De- scrip- tion	Misfire Crankshaft Speed Fluctuation (Sin Gle Or Multis ple)	Catalyst damage misfire: Catalyst damaging misfire rate > 5.20 – 31.25% Emission threshold misfire within 1,000 rev: Emission threshold misfire rate (MR) > 2.25%	 ters with Enable Conditions Initial engine speed > 550 RPM Engine speed > 550 RPM Engine speed < 6,848 RPM Time after engine start not calibrated s Engine load > 4.36 - 44.0% 	Time tion Length 200 rev Continuous Continuous	- Check the spark plugs visually for signs of fouling Check the intake system visually for leaks (false air) Check for an engine methanical fault
			start > -48° C Fuel cut off not active Single fuel cut off not active Number of fade out cylinders < 2.0 [-] Dynamic manifold air pressure not calibrated kPa Dynamic throttle position not calibrated ° TPS/s Dynamic of engine load not calibrated % Engine not calibrated RPM Dynamic of ignition angle @ idle speed not calibrated ° CRK Dynamic of ignition angle not		fer to appropriate repair manual for low compression readings or for carbon buildup removal. - Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/ or to appropriate repair manual. - Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
			calibrated ° CRK		 Check the Ig- nition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL'Illumina-	agnostic Proce- dure
tion		Emission threshold misfire within 4,000 rev: Emission threshold misfire rate (MR) > 2.40%	• Rough road not detected	• 4 x 1,000 rev • Contin- uous		with Power Output Stage . Refer to ⇒ "3.6.47 Ig- nition Coils With Power Output Stage . Checking page 1133.

DT Do scr tid	ip-	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Су	lin-	Misfire Crankshaft Speed Fluc-	Catalyst dam- age misfire:	Initial engine speed > 550 RPM	200 revContin-	• 2 DCY (NAR)	 Check the spark plugs visually for
Mi fir	is- e	tuation (Sin- gle Or Multi-	• Catalyst dam- aging misfire rate > 5.20 –	550 RPM	uous		signs of foul- ing.
tec	e- ted	ple)	31.25%	• Engine speed < 6,848 RPM	4.000		Check the in- take system
			Emission threshold mis- fire within	Time after engine start not calibra- ted s	1,000 revContin-		visually for leaks (false air).
			1,000 rev:Emission threshold mis-	• Engine load > 4.36 – 44.0%	uous		Check for an engine me-
		fire ra	fire rate (MR) • depending on		chanical fault with a cylin- der compres- sion test.		
			_{IvsWagen} AG. Volksw	ECT @ cylinder block @ engine agents <= -48° C The contraction of the cylinder of the cy			Carbon buildup may cause a high- er than nor-
		ised by	Volvo	Then activation if			mal com- pression
		inless author.		• ECT @ cylinder block >= 20° C	accept		reading and may contrib- ute to this
	STATIST OF	3		ECT @ cylinder block @ engine start > -48° C	, accaptany liability with respon		concern. Re- fer to appro- priate repair
ole, is not				Fuel cut off not active	Nwithres		manual for low com- pression
Orin wh		Jamaa iyamaa iqaajaajad	Single fuel cut off not active		*tot	readings or for carbon buildup re-	
ses, iii par				Number of fade out cylinders < 2.0 [-]		hecorrectn	moval. - Check the
nercial purpos				Dynamic mani- fold air pressure not calibrated kPa		ness of inc	fuel pressure and delivery quantity. Re- fer to fuel system me-
Comi	inate			Dynamic throttle position not cali- brated ° TPS/s	The state of the s		chanical test- ing in ⇒ "3.1 Pre- liminary
	Ý	DI GUIAdo		Dynamic of engine load not calibrated %	Jugun		Check", page 13 and/ or to appro-
	inpinydos	14611Vd00	1qpected pl	Engine not cali- brated NOV			priate repair manual.
			.⊶d				 Check the Fuel Injectors . Refer to
				Dynamic of ignition angle @ idle speed not calibrated ° CRK			⇒ "3.6.14 Fuel Injec- tors , Check- ing",
				Dynamic of igni- tion angle not calibrated ° CRK			page 1127 . - Check the Ignition Coils

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions		MIL Illumina- tion	Component Diagnostic Procedure
ommercial purposes, in part or in whole, is hot _{pope}	of the state of th	Distroised by Volkey	Emission threshold misfire within 4,000 rev: Emission threshold misfire rate (MR) > 2.40% Plant A	ters with Enable Conditions Rough road not detected Gdoes not guarantee or Rock of the state o	4 x 1,000 rev Continuous		with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking". page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cylin- der 3	Misfire Crankshaft Speed Fluc- tuation (Sin- gle Or Multi- ple)	 Catalyst damage misfire: Catalyst damaging misfire rate > 5.20 – 31.25% 	speed > 550 RPM	200 rev Continuous	• 2 DCY (NAR)	 Check the spark plugs visually for signs of fouling. Check the intake system
		Emission threshold mis- fire within 1,000 rev: Emission	Time after engine start not calibrated s Engine load > 4.36 – 44.0%	• 1,000 rev • Continuous		visually for leaks (false air). - Check for an engine me-
	threshold mis- fire rate (MR) > 2.25%	depending on ECT @ cylinder block @ start ECT @ cylinder			chanical fault with a cylin- der compres- sion test. Carbon	
			block @ engine start <= -48° C • Then activation if • ECT @ cylinder block >= 20° C	_{vagen} AG. Volk	swagen AG does no	buildup may cause a high- er than nor- mal com- pression reading and may contrib-
			ECT @ cylinder block @ engine start > -48° C Euel cut off not			may contrib- ute to this concern Re- fer to appro- priate repair manual for
		n part or in whole, is no	 active Single fuel cut off not active Number of fade out cylinders 			low com- pression readings or for carbon buildup re- moval.
		commercial purposes, in part	2.0 [-] Dynamic manifold air pressure not calibrated kPa			Check the fuel pressure and delivery
		Commercia	Dynamic of en-			quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check",
			 gine load not calibrated % Engine not calibrated 6 Engine speed not 	erV		page 13 and/ or to appro- priate repair
			calibrated RPM Dynamic of ignition angle @ idle speed not calibrated ° CRK	_{pejo1} q	-DA negswey	⇒ "3.6.14 Fuel Injectors , Check-
			Dynamic of ignition angle not calibrated ° CRK			page 1127 . - Check the Ignition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	on commercial purposes, in part or in whole, is not better.	Emission threshold misfire within 4,000 revision threshold misfire rate (MR) > 2.40% Emission threshold misfire rate (MR) > 2.40%	Secondary Parameters with Enable Conditions • Rough road not detected wagen AG **Dato.1d** **	4 x 1,000 Conting uous	e o taccapter liability with respect	with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking", page 1133 .

	Mes			-Co	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illumina- Time Length	Component Diagnostic Procedure
Cylin- der 4	Misfire Crankshaft Speed Fluc- tuation (Sin- gle Or Multi- ple)	 Catalyst damage misfire: Catalyst damaging misfire rate > 5.20 – 	speed > 550 RPM • Engine speed > 550 RPM	uous	Check the spark plugs visually for signs of fouling.
tected		31.25% • Emission	 Engine speed < 6,848 RPM Time after engine start not calibrated s Engine load > 	rev	Check the intake system visually for leaks (false air). Check for an
00,100,100,100,100,100,100,100,100,100,	S Elikado Meinvados	Emission threshold mis- fire rate (MR) > 2.25%	 4.36 – 44.0% depending on ECT @ cylinder block @ start ECT @ cylinder cylin	· Conting uous	engine me- chanical fault with a cylin- der compres- sion test. Carbon buildup may
	*46juAdoo	Protected by	block @ engine start <= -48° C Then activation if ECT @ cylinder block >= 20° C		cause a high- er than nor- mal com- pression reading and
			 ECT @ cylinder block @ engine start > -48° C Fuel cut off not 		may contrib- ute to this concern. Re- fer to appro- priate repair manual for
			 active Single fuel cut off not active Number of fade out cylinders < 		low com- pression readings or for carbon buildup re- moval.
			2.0 [-]Dynamic manifold air pressure not calibrated kPa		 Check the fuel pressure and delivery quantity. Re- fer to fuel system me-
			 Dynamic throttle position not calibrated ° TPS/s Dynamic of engine load not calibrated 		chanical test- ing in ⇒ "3.1 Pre- liminary Check", page 13 and/
			brated %Engine not calibrated		or to appro- priate repair manual.
			 Engine speed not calibrated RPM Dynamic of ignition angle @ idle speed not calibrated ° CPK 		- Check the Fuel Injec- tors . Refer to ⇒ "3.6.14 Fuel Injec- tors , Check-
			 brated ° CRK Dynamic of ignition angle not calibrated ° CRK 		ng". page 1127 Check the Ignition Coils

DT De scr	e- Strategy	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	p- Description	10/83	Conditions Conditions	Length 4 x 1,000 fev Continuous		with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage , Checking", page 1133 .

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Knock /Com- bus- tion Vibra- tion Sen- sor 1 Circuit Rang e/Per- for- manc e Bank 1 or Single Sen-	Knock Sensor (KS) Rationality Check Low	Difference between knock sensor signal and average knock sensor signal < 0.0 – 0.12 V	ECT @ cylinder block > 60° C Air mass > 229.0 mg/rev	4.3 s Continuous agen AG. Volks	• 2 DCY (NAR)	- Check the Knock Sensor 1 - G61 - Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.
	Knock Sen- sor (KS) Out Of Range	• Sensor signal < 0.12 – 0.31 V	• ECT @ cylinder	• 4.0 s	• 2 DCY (NAR)	- Check the Knock Sensor 1 - G61-Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.
		Oremmory	Air mass > 229.0 mg/rev • Engine speed > 2,016 RPM	Selon ^q	Kawagen AG.	ON TO MADING O THE HITTORY THE STATE OF THE

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring M Time Length	/IIL Illumina- tion	Component Diagnostic Procedure
	Crankshaft Position (CKP) Sen- sor Activity Check	 Case 1: Counted exhaust camshaft signals without synchronization >= n.a. [-] Counted intake camshaft signals without synchronization n.a. [-] Case 2: Counted exhaust camshaft signals without synchronization >= 1.0 [-] Counted intake camshaft signals without synchronization >= 1.0 [-] 	tion not detectedEngine speed >=	• 0.01 s • Continuous	2 DCY (NAR)	 Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121. Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107.
rt or in whole, is not	Crankshaft Position (CKP) Sensor CPDD - Crankshaft Position Out Of Range	 Pulse width backwards < √62, ≥ 150 μs For number of pulse widths outside tolerance > 1.0 [-] Pulse width forwards < 15; > 62 μs For number of pulse widths outside tolerance > 1.0 [-] 	400 RPM • Engine stop active • Engine speed > olksv32 of A1,200 RPM • Engine speed > olksv32 of A1,200 RPM	• 1,800.0° CRK • Continuous	ithrespect to the c	
Crank shaft Posi- tion Sen-	Crankshaft Position (CKP) Sensor Loss Of Synchronization Rationality Check	Crankshaft synchronization lost	Engine running	• 2,160.0° • CRK • Continuous	2DCY (NAR)	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121 Check the Camshaft Position Sensor -

	1		Johnswagen Ad. Volkswag		-	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina-	Component Diagnostic Procedure
	Crankshaft Position (CKP) Sensor Tooth Number Rationality Check	 One or two additional teeth recognized incorrect Or One or two teeth missed 	• Engine speed > 320 RPM	 1,800.0° CRK Continuous 	(a)	G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107
	Crankshaft Position (CKP) Sen- sor Tooth Period Ra- tionality Check	 Sensor signal < 50 – 156 μs Engine speed > 1,200 RPM Sensor signal < 30 μs Engine speed <= 1,200 RPM 	Engine running	45,720.0 CRKContinuous		page 1107.
	Crankshaft Position Sensor Segment Monitoring Out Of Range	• Segment adaptation >= 7.0%	• Fuel cut off all cylinders active • Segments in fuel cut-off mode >= 32.0 [-]	• 180.0° CRK • Continuous sylo	Verigition Jag	
P0340 Cam- shaft Posi- tion Sen- sor "A" Circuit Bank 1 or Single Sen- sor	Position (CMP) In- take Sensor Signal Ac- tivity Check	 Signal change not detected For number of reference gap >= 3.00 [-] 	• Engine speed > 32 RPM	 2,520.0° CRK Continuous 	• 2 DCY (NAR)	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 , Checking", page 1107 . - Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28 , sor G28
P0341 Cam- shaft Posi- tion Sen- sor "A" Circuit Rang e/Per-	Camshaft Position (CMP) In- take Sensor Rationality Check	 Segment period ratio factor < 0.36; > 2.75 [-] Offset between camshaft and crankshaft < -79.0; > 15.0° CRK 	• Engine speed > 32; < 8,160 RPM	• 952.5° CRK • Continuous	• 2 DCY (NAR)	Checking", page 1121. - Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40,

	1	1		1		
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
for- manc e Bank 1 or Single Sen-	Camshaft Position (CMP) In- take Sensor Angular Off- set Check	Offset be- tween cam- shaft and crankshaft < -79.0; > 15.0° CRK	• Engine speed > 32 RPM	• 450.0° CRK • Once / DCY		Checking", page 1107 - Check the Engine Speed Sen- sor - G28-
sor	Camshaft Position (CMP) In- take Sensor Signal Ac- tivity Check	• Segment time value < 50 μs	• Engine speed > 32; < 8,160 RPM	• 1,440.0° CRK • Continuous		Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.
P039 B Cylinder 1 Pressure Too High	Knock Control Function Check	 Slow detection: Ratio between knock sensor and knock threshold in main knock window > 2.0 – 3.0 [-] For time >= 9,000.0 – 11,700.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 – 5.0 [-] For time >= 5,760.0 – 6,840.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 – 5.0 [-] Ratio between knock sensor and knock sensor and knock window > 3.50 – 5.0 [-] Ratio between knock sensor and knock window > 2.0 – 3.0 [-] For time >= 12,960.0 – 16,740.0° CRK Torque limitation factor < 0.90 [-] 	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Air mass > 403.0 – 501.0 mg/rev Dynamic engine speed not active Delay time not calibrated seg 	uous _{arani}	• 2 DCY (NAR)	- This DTC may set due to poor fuel quality or fuel that has aged exces- sively. If nec- essary, drain the fuel from the vehicle and replace with fresh fuel. Check the spark plugs visually for signs of foul- ing. Check for an engine me- chanical fault

	onitor rategy	Malfunction Cri- teria and Thresh-	Secondary Parameters with Enable	Monitoring Time	MIL Illumina-	Component Diagnostic Proce-
scrip- Des	cription	old Value	Conditions	Length	MIL illumina- tion	dure
		 Fast detection: Ratio between knock sensor and knock threshold in main knock window > 1.50 – 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 – 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 – 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] 	Air mass > 403.0 - 501.0 mg/rev Misfire detection active Dynamic engine speed not active Delay time not calibrated seg	BENSHION NOTHERNAGE	S. W.	Knock Sensor 1 G61, Checking", page 1141. Check the Engine Speed Sensor - G28 Refer to \$\infty\$ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P03A 5 Cylinder 2 Pressure Too High	Knock Control Function Check	tion: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 9,000.0 - 11,700.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] For time >= 5,760.0 - 6,840.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-]	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Air mass > 403.0 – 501.0 mg/rev Dynamic engine speed not active Delay time not calibrated seg 		• 2 DCY (NAR)	- Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal.	A CONTRACTOR OF THE PROPERTY O

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Fast detec-	Engine running			Checking", page 1121
		tion: Ratio between knock sensor	ECT @ cylinder block > 60° C			<u>page 1121</u> .
		and knock threshold in main knock	• Engine speed 1,216 – 6,400 RPM			
		window > 1.50 - 2.50 [-]	ngino loda ma.			
		• For time >= 540.0° CRK	• Air mass > 403.0 - 501.0 mg/rev			
		Ratio between knock sensor and noise lev-	Misfire detection active			
		el in pre knock window > 2.75 – 4.50 [-]	Dynamic engine speed not active	G. Volkswagen	A	
		• For time >=	Delay time not calibrated seg	0	nd does not guara	No.
		• Case 1:	355 au			Oracca
		• Ratio between filtered engine roughness and misfire detection threshold <= 0.41 \$\frac{1}{2}\$ 0.59 [-]				Orany liability with respect
		• Case 2:				othe
		Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Case 35	Air mass > 403.0 – 501.0 mg/rev Misfire detection active Dynamic engine speed not active Delay time not calibrated seg Sesaumon Houndon Agreened			correctness of information
		Ratio between filtered engine roughness.	Andoo yapajoajoid		Jugan Olkania	Myddo ilalinga ar
		Ratio between normalised engine rough- ness and mis- fire detection threshold n.a. [-]	Profeeding	.6	Anegsway	

De- St	lonitor rategy scription	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
F trol I	ck Con- Func- Check	tion: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 9,000.0 - 11,700.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] For time >= 5,760.0 - 6,840.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and knock sensor and knock window > 2.0 - 3.0 [-]	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Air mass > 403.0 – 501.0 mg/rev Dynamic engine speed not active peed not active active and the speed not calibrated seg 			 This DTC may set due to poor fuel quality or fuel that has aged excessively. If necessary, drain the fuel from the vehicle and replace with fresh fuel. Check the spark plugs visually for signs of fouling. Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61- Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61- Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61- Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61- Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61- Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Engine Speed Sensor - G28- Refer to appropriate repair manual for low compression readings or for carbon buildup removal.

DTC /	Monitor	Malfunction Cri-	Secondary Parame-	Monitoring	MIL Illumina-	Component Di-
De- scrip- tion	Strategy Description	teria and Thresh- old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure
De- scrip-	Strategy	 Fast detection: Ratio between knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.44 0.50 L 1 	Conditions • Engine running • ECT @ cylinder block > 60° C • Engine speed 1,216 – 6,400 RPM • Engine load n.a. % • Air mass > 403.0 – 501.0 mg/rev • Misfire detection active • Dynamic engine speed not active • Delay time not calibrated seg	Time Length	tion	Checking", page 1121.
		Ratio between filtered engine roughness and misfire detection threshold n.a. Ratio between normalised engine roughness and misfire detection threshold n.a.				
			* Standardoo Haps		D SOME	MONAGHERICOOMANA NON

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P03B 9 Cylin- der 4 Pres- sure Too High	Knock Con- trol Func- tion Check	 Slow detection: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % 	• 900.0° CRK • Continuous	• 2 DCY (NAR)	- This DTC may set due to poor fuel quality or fuel that has aged exces- sively. If nec- essary, drain the fuel from the vehicle and replace
46	ikedunese authorisee	9,000.0 AG. Voll 17,700.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50	 Air mass > 403.0 501.0 mg/rev Dynamic engine speed not active Delay time not calibrated seg 	⁸ e or acceptant library		with fresh fuel. - Check the spark plugs visually for signs of foul- ing.
or commercial purposes, in part or in whole, is not be	a. T.	 For time >= 5,760.0 - 6,840.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] 	-DA nagewaylo V va mgr		arth respect to the correctness of Information	 Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low com-
	EURO DUNGOO WOUN	For time >= 12,960.0 - 16,740.0° CRK Torque limitation factor <	. DA negswexlloV vombi	KIDO TU		pression readings or for carbon buildup re- moval.
		0.90 [-]				- Check the Knock Sensor 1 - G61 - Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.
						- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28,

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
- Ratio between knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] - For time >= For time >= Sol.0* CRK - Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] - For time >= 360.0* CRK - Case 1: - Ratio between filtered engine roughness and misfire detection threshold n.a. [-] - Case 3: - Ratio between normalised engine roughness and misfire detection threshold n.a. [-] - Ratio between normalised engine roughness and misfire detection threshold n.a. [-] - Ratio between normalised engine roughness and misfire detection threshold n.a. [-] - Ratio between normalised engine roughness and misfire detection threshold n.a. [-] - Ratio between normalised engine roughness and misfire detection threshold n.a. [-]				Engine running			Checking", page 1121
knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window ≥ 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold and misfire detection threshold n.a. [-] Case 3: Ratio between nilitire dengine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-]							pago
window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-]			knock sensor and knock	• Engine speed 1,216 – 6,400			
For time >= 540.0° CRK Ratio between knock sensor and noise level el in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-]			window > 1.50	• Engine load n.a.			
knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 2? on AG. Volkswagen AG does not go and misfire detection threshold n.a. [-] Case 3: Ratio between filtered engine rorughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-]				• Air mass > 403.0			
and noise level in pre knock window > 2.75 - 4.50 [-] • For time >= 360.0° CRK • Case 1: • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Case 3: • Ratio between normalised engine roughness and misfire detection threshold n.a. [-] • Case 3: • Ratio between normalised engine roughness and misfire detection threshold n.a. [-] • Case 3:			Ratio between knock sensor	IVIISIII C GCCCCCIOTI			
window > 2.75 - 4.50 [-] • For time >= 360.0° CRK • Case 1: • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Case 3: • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Case 3: • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Case 3:			and noise lev-				
• For time >= 360.0° CRK • Case 1: • Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] • Case 2; AG. AG. Dikswagen AG. does not guarantee detection threshold normalised engine roughness and misfire detection threshold n.a. [-] • Case 3: • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Ratio between roughness and misfire detection threshold n.a. [-] • Ratio between normalised engine roughness and misfire detection threshold n.a. [-]			window > 2.75				
360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 23: Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-]							
Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 2 ^{ng AG. V} olkswagen AG does not guaranteed engine roughness and misfire detection threshold n.a. [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-]				Calibrated seg			
filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] • Case 23 and AG. Volkswagen AG does not guaranteed engine roughness and misfire detection threshold n.a. [-] • Case 3: • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Ratio between normalised engine roughness and misfire detection threshold n.a. [-]							
• Case 3: • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Ratio between normalised engine roughness and misfire detection threshold n.a. [-]			filtered engine roughness and misfire detection threshold <=	olkswagen AG does			
• Case 3: • Ratio between filtered engine roughness and misfire detection threshold n.a. [-] • Ratio between normalised engine roughness and misfire detection threshold n.a. [-]		5,0	Ratio between	ases not guara	0.		
	Snoth	Seilled Unless authori	normalised engine rough- ness and mis- fire detection threshold n.a. [-] • Case 3:		necoraceptan,	with with	
	'hole,		Ratio between			respe	
	oses, in part or in w		filtered engine roughness and misfire detection threshold n.a. [-]			oct to the correctnes	
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Nolkswagen AG. Protected by		ZOLINGO ZUE	Protected by copyright	DA Nolkewagen AG.	Penyoo, ing		

DT0 De scri tio	Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P04 System and the second state of the second secon	Air Injection (AIR) Func- tional Check	tivation > 5.0 kPa	 General: AIR pump ready Catalyst heating active AIR finished MAF <= 140.0 kg/h MAF <= 10; < 10; < 115° Coulon IAT @ manifold >= -10; < 100° Co Modeled catalyst temperature < 700° Co Relative barometric pressure > 0.73 [-] Diff. BARO vs. MAP n.a. kPa Engine n.a. 	Once / DCY O	• 2 DCY (NAR)	 Check the Secondary Air Injection Sensor 1 - G609 Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609. Checking", page 1159. Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101. Checking", page 1157. Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112. Checking", page 1163. Check the Secondary Air System GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24. Checking", page 1165.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Mile Illumina- tion	Component Diagnostic Procedure
P0413 AIR Sys- tem Switc hing Valve "A" Circuit Open	Secondary Air njection (AIR) Valve Open Cir- ctid ui 'sesodund piologia (AIR) Valve	Output volt- age (hard- ware values) 1.85 – 2.28 V	 Engine running Actuator commanded off 	0.5 sContinuous	ORR DAA	- Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163.
	The Aller Louis	Infanta infant	ng ĐA nagsung	MOV VOINBINGOS	, the burney of the second	- Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 . Checking", page 1165 .
P0414 AIR Sys- tem Switc hing	Secondary Air Injection (AIR) Valve Short To Ground	Output volt- age (hard- ware values) < 1.85 – 2.28 V	 Engine running Actuator commanded off 	0.5 sContinuous	• 2 DCY (NAR)	Check the Secondary Air Injection Solenoid Valve - N112 Refer
Valve "A" Circuit Shor- ted	Secondary Air Injection (AIR) Valve Short To Battery Plus	 Actuator temperature > 155 - 185° C Or Output current (hardware values) driver 	 Engine running Actuator commanded on 			to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163.
		stage internal value				- Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24, Checking", page 1165

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0418 AIR Sys- tem Con- trol "A" Circuit	Secondary Air Injection (AIR) Pump Relay Open Circuit	 Output voltage, lower range 1.92 – 2.21 V Output voltage, upper range (hardware values) <= 2.85 – 3.25 V 	Engine running Actuator commanded off	0.5 sContinuous	• 2 DCY (NAR)	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.



De- Strategy teria	lfunction Cri- a and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure	
Cata-lyst NMOG / NMOK Conversion Capability Below Thres hold Bank 1 1 Cata-lyst NMOG / NMOX Conversion Capability E Cicata-lyst NMOG / NOX Conversion Capability A are refined to the conversion Capability Cicata-lyst NMOG / NOX Conversion Capability Cicata-lyst NOX Conversion Capab	Catalyst efficiency not calibrated [-] EWMA filtered Catalyst efficiency not calibrated [-] Arithmetic average, corrected with neasured deay and transition time of exygen sensors rear Catalyst efficiency not calibrated [-] Catalyst efficiency not calibrated [-]	ance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s Engine speed 1,344 - 3,008 RPM Lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0%		• 2 DCY (NAR) wagen AG does no	- Check the Three Way Catalytic Converter (TWC). Refer to 3.6.33 Three e Way Catalytic Converter. TWC Checking", page 1168 Check the Oxygen Sensor 1 After Catalytic Converter GX7 Refer to 3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149 Check the Oxygen Sensor 1 Before Catalytic Converter GX10 Refer to 3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Lambda adaption not active			
			Valve lift not equipped			
			Temperature conditions:			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) > -48° C			
			Modeled catalyst temperature once after engine start > 550° C			
			Modeled catalyst temperature @ start of diagnosis 500 – 700° C			
			Modeled catalyst temperature duruk ing diagnosis 470 730° C	swagen AG doe	s not guarante	
		in the state of th	 Integrated air mass, catalyst temperature con- ditions fulfilled not calibrated g 		or de co	Sold Ideal
		art or in whole, is no	 Modeled catalyst temperature @ start of diagnosis 500 – 700° C Modeled catalyst temperature during diagnosis 470 – 730° C Integrated air mass, catalyst temperature conditions fulfilled not calibrated g Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 – 254.0 K Diff. between dynamic between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 – 254.0 K 			with respect to the o
		Copyring to the part of the whole, is not being the part of the whole, is not being the part of the pa	 Diff. between dynamic and stationary catalyst temperature during diagnosis 304.0 – 304.0 K 			to the correctness of information in this country.
		are of comme	Modeled catalyst temperature @ start > 550° C			nation in this
		Halo Collingo	Modeled EGT @ O2S rear <= 1,201° C		r. (206)	all divine the second s
		72,	Air mass condi- tions:	-62N	SHOV KOMBING	
			Air mass @ start of diagnosis 125.01 – 580.0 mg/rev	.₽An _{aner} ,		
			Air mass during diagnosis not calibrated mg/rev			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h			
			 MAF per cylinder during diagnosis 35.0 – 135.0 kg/h 			
			Load conditions:			
			 Air mass set point 125.01 – 580.0 mg/rev 			
			Engine load not calibrated %	/olkswagen 4 o		
			Accelerator pedal yalue not calibra- Accelerator pedal yalue not calibrator peda	- and agen AG	does not guarantee	
		ercial purposes, in part or in whole, is not be mile of the second of th	For time not cali- brated s			Taccap _f
			Low dynamic conditions			While
			 Dynamic engine speed < 20 RPM 			with resp
			 Dynamic air mass < 25.01 mg/ rev 			ect to the
			Dynamic lambda controller output < 20.0%	Yolkswagen AG		correctness
			 Integrated air mass after dy- namic conditions are fulfilled > 20.0 g 			of information in
		mmoo to see of Commo	Evap purge con- ditions: Case 1			This of the state
		*Si _{IACI}	Evap purge valve not calibrated Case 2 Canister load cal-		2 Vedrigity	.ing,
			Canister load cal- culation not cali- brated	.ĐA ng	^{OIK2M30}	
			Evap purge flow not calibrated			
			• Case 3			
			Canister load not calibrated [-]			
			Evap purge flow not calibrated			
			Close the gap conditions:			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			O2S rear voltage @ diagnosis start >= 0.55 V			
			 Integrated air mass @ start di- agnosis not cali- brated g 			
			 O2S front dynamic diagnosis separate not active 			
			 For arithmetic average value calculation: 			
		wagen	Number of checks required for valid result >= AG. \(\frac{2.0}{2.0} \sigma_{\text{G dos}} \)			
		regpy Volkswas	For EWMA-filter:	t guar		
	, kedunies s	authorise	 for valid result >= AG. 22.0s[n] gen AG does not be successful or success	anice or acce	0 ₁ ,	
	ole, is not permi		 Step change de- tection will initiate multiple tests per DCY 		liability with res	
	art or in wh		 Conditions for step change de- tection: 		pect to the	
	arcial purposes, imp.	autrorised by Volkswagen	 Relative deviation between new measured value and old EWMA filtered value not calibrated [-] 		d and liability with respect to the correctness of information of the correctness of information of the correctness of the corr	
	Nate of commi		Number of checks not cali- brated [-]		nation in this o	
	A TO TO TO TO	Protected by copyright, Copyright	JKewagen A.G.	N KQJUBI JAGO JAG	sss of information in this oouth	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions		IIL Illumina- tion	Component Diagnostic Procedure
P043 E EVAP Sys- tem Leak De- tec- tion Refer- ence Orifice Low Flow	Evaporative Emission (EVAP) System Out Of Range High	Evap pump current during reference measurement > 40.0 mA Evap pump Evap pump Evap pump	 Barometric pressure > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C	• 624.0 s • Once / DCY	2 DCY (NAR)	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P043 F EVAP Sys- tem Leak De- tion Refer- ence Orifice High Flow	Evaporative Emission (EVAP) System Out Of Range Low	roforance	 Barometric pressure > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h long Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) Airbag not activated 	• Once /		o tion Pumn - I



				arant-		
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina-	Component Diagnostic Procedure
P0441	Emission (EVAP) Canister Purge Valve Func- tional	Ratio actual intake manifold pressure and modeled set point intake manifold pressure < 0.05 [-] Ratio actual intake manifold pressure and modeled set point intake manifold pressure < 0.05 [-]	 ECT @ cylinder block > 58° C BARO > 73.0 kPa AAT > 5° C AAT @ start >= 5° C Diff. BARO vs. filtered MAP >= 25.0 kPa Diff. BARO vs. filtered MAP > 25.0 - 40.0 kPa Engine speed < 2,800 RPM ratio MAF @ manifold and MAF max > 0.070.09 [-] Engine speed < 1,180 RPM Coasting function not calibrated Vehicle speed >= 5 km/h Diff. engine speed < 90 RPM Diff. ratio MAF @ manifold and MAF max vs. ratio filtered MAF @ manifold and MAF max vs. filtered engine speed < 90 RPM Diff. modeled MAP < 1.50 kPa Integrated air mass since engine start >= 0.0 - 5,000.0 g lambda conditions fulfilled Lambda control active Lambda control value -30.0 - 30.0% O2S front 0.95 - 1.05 [-] 	• 8.5 s • Once / DCY	• 2 DCY (NAR)	- Check the EVAP Canister Purge Regulator Valve 1-N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
			 Fuel cut off not calibrated Case 1: Integrated air mass @ canister purge valve per driving cycle not calibrated g Case 2: Ratio MAF @ canister purge and MAF per cylinder not calibrated [-] canister purge sampling rate >= 40.0% integrated air mass @ canister purge valve >= 2.1 g Depending on AAT: AAT >= 20° C Canister load <= 0.09 [-] Or AAT >= 20; < 30° C Canister load <= 0.09 [-] AAT < 30° C Canister load <= 0.09 [-] 	ithorised by Volks	_N agen AG. Volksw	agen AG does not guar	The e of acceptany liability with respect to the constant of information in this occurred by the constant of t
			0.27[-]	D JUGUNDOO KAPE	Protect	No Waysen A.G.	J.B.J.Kdo O. J. J. B.J.Kdo O. J. J. B.J. B.J.Kdo O. J. J. B.J. J.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0442 EVAP Sys- tem Leak De- tected (Small Leak)	Evaporative Emission (EVAP) System Small Leak Rationality Check	 Difference pump current vs. rough leak reference current < 0.0 mA And For time >= 600.0 s 	 Barometric pressure > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s 	• 624.0 s • Once / DCY	• 2 DCY (NAR)	 Check the EVAP System for Leaks. Refer to ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6 Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator
tole, is not bern,	edunes sauthorised	by Volkswagen AG. Volks	Engine stop (during ECM keep alive-time) wagen AG does not guarante Fingine start not Fingine start not	Oraccaptand liability Millian	(Jeg)	Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
EVAP Sys- Led Purge Con- trol Valve Walve Circuit Open	Emission (EVAP) Canister Purge Valve Open Circuit	age lower range >= 1.92 - 2.21 V Output voltage upper range (hardware values) <= 2.85 - 3.25 V	 Engine running Evap purge valve opening signal (PWM) > 3.13; <= 98.83% 	• 2.0 s • Continuous	2 DCY (NAR)	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- n AG. Tion swage	Component Diagnostic Procedure
P0445 EVAP System Purge Control Valve "A" Circuit Shorted	Evaporative Emission (EVAP) Canister Purge Valve Short To Ground	Output volt- age (hard- ware values) 1.92 – 2.21 V	 Engine start not active Engine running Evap purge valve opening signal (PWM) <= 98.83% Actuator commanded off 	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80,
	Evaporative Emission (EVAP) Canister Purge Valve Short To Battery Plus	 Actuator temperature 160 – 200° C Output current (hardware values) driver stage internal value 	 Engine start not active Engine running Evap purge valve opening signal (PWM) >= 3.13% Actuator commanded on 			Checking", page 1123
P0447 EVAP Sys- tem Vent Con- trol Circuit Open	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Open Circuit	age lower range 1.85 – 2.28 V	Actuator commanded off Manded off M	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the Leak Detection Pump - V144 - Refer to 3.6.22 Leak Detection Pump V144 , Checking", page 1143 .
Con- trol	Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Ground	 Output volt- age (hard- ware values) 1.85 – 2.28 V 	Actuator com- manded off	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detec-
Circuit Shor- ted	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Battery Plus	perature > 155 – 185° C • Or	Actuator com- manded on			tion Pump V144 , Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
EVAP Sys- tem Leak De- tected (Very Small Leak)	(EVAP) System Very Small Leak Ra- tionality Check	pump current vs. small leak reference cur- rent < 0.0 mA Pump current measurement time > 600.0 s And Pump current gradient >= 0.30; <= 0.01 mA/s Pump current gradient <	Barometric pressure > 73.0 kPa AG. Volkswagen AG. AAT 4 – 38° Cosno ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s Evap purge adaptation < 0.30 [-] Engine stop (during ECM keep alive-time)	02 1.0 0	2 DCY (NAR) 3 DCY (NAR) 4 double of the correctness of information in this cool, and the correctness of information in the correc	- Check the EVAP System for Leaks. Refer to ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0491 AIR Sys- tem Insuf- ficient Flow Bank 1	Secondary Air Injection (AIR) Func- tional Check	 Case 1: Blockage: Ratio relative measured secondary air pressure [tube blocked] < 0.65 [-] Leakage: Ratio relative measured secondary air pressure and modeled secondary air pressure pulsations and actual integrated secondary air pressure pulsations and actual integrated secondary air pressure pulsations n.a. kPa/s Case 3: Blockage: Ratio relative measured secondary air pressure and modeled secondary air pressure [tube blocked] < 0.03 [-] Leakage: Ratio relative measured secondary air pressure [tube blocked] < 0.03 [-] Leakage: Ratio relative measured secondary air pressure [leak diagnosis] < 0.03 [-] 	- Dolotivo boro	• 0.1 s • Once / DCY	6EMSHO MARING	- Check the Secondary Air Injection Sensor 1 - G609- Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101- Refer to ⇒ "3.6.28 Secondary Air Injection Pump Motor V101, Checking", page 1157 - Check the Secondary Air Injection Pump Motor V101, Checking", page 1157 - Check the Secondary Air Injection Solenoid Valve - N112- Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112- Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163 - Check the Secondary Air System GX24- Refer to ⇒ "3.6.32 Secondary Air System GX24- Checking", page 1165

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0501 Vehi- cle Speed Sen- sor	COM: Vehicle Speed Sensor (VSS) Communication With VSS	 Speed sensor fault value: out of range high failure Speed sensor 		• 0.5 s • Continuous	• 2 DCY (NAR)	 Check the vehicle speed signal. Refer to ⇒ "3.6.36 Vehicle Speed
"A" Circuit Rang e/Per-		fault value: out of range				Signal, Checking", page 1174
for- manc e		Speed sensor fault value: ra- tionality/check wsw high failure	en AG does not guara			 Check the CAN-Bus terminal re- sistance. Re- fer to
	ss authorise	Speed sensor fault value: rationality/check high failure Speed sensor fault value: rationality check low failure Diagnostic	en AG does not guarantee or ac	Rop And I like		⇒ "3.6.5 CAN- Bus Terminal Resistance, Checking", page 1109
P0502 Vehi- cle Speed Sen- sor	Vehicle Speed Sen- sor (VSS) Short To Ground	Diagnostic signal from output driver failure		0.02	• 2 DCY (NAR)	 Check the vehicle speed signal. Refer to ⇒ "3.6.36 Vehicle Speed
"A" Circuit Low	Speed Sensor (VSS) Open Circuit			he correctnes		Signal, Checking", page 1174
ommercial purk	Vehicle Speed Sen- sor (VSS) Short To			s of informatio		 Check the CAN-Bus terminal re- sistance. Re- fer to
O O O O O O O O O O O O O O O O O O O	Speed Sensor (VSS) Short To Ground Vehicle Speed Sensor (VSS) Open Circuit Vehicle Speed Sensor (VSS) Short To Battery Plus			• Contine correctness of information in this country.		⇒ "3.6.5 CAN- Bus Terminal Resistance, Checking", page 1109
	JAGUADOO AQ	Protected	DA Nagswaylo V Vatilbingro			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Control (ISC) Function Monitoring: Engine Speed Deviation	- 100 IXF WI	tions: Vehicle speed = 0 km/h Accelerator pedal released by driver Throttle actuator commanded on Evap purge flow < 8.0 kg/h Engine running Time after engine start not calibrated s	• 10.0 s • Continuous *SUATANTESO TREE *NOTE: NOTE:	2 DCY (NAR) A conviction in the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of information in this could be a converted to the correctness of the correctness	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .

DTC / De- scrip- tion	Monitor Strategy Description		lalfunction Cri- ria and Thresh- old Value	Se	econdary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P0507 Idle Con- trol	Idle Speed Control (ISC) Func- tion Moni-		gine speed vs. engine speed set point > 200 RPM Integrated I- part of idle speed control- ler n.a.	engine speed	•	General conditions: Vehicle speed = 0	10.0 sContinuous	• 2 DCY (NAR)	Check the Throttle Valve Con- trol Module -
Sys- toring tem gine s	toring: En- gine Speed Deviation				km/h Accelerator pedal released by driver Throttle actuator commanded on	_{en} AG. Volkswa	gen AG does poo	GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169 Arapage 1169 Arapage 1169	
				•	Evap purge flow < 8.0 kg/h		Mot g		
				odus	Engine running Time after engine start not calibra- ted s		7		
			6, isn	•	Clutch switch n.a.				
		or commercial purposes, in part or in whole, is not	orin who,	•	Barometric pressure > 70.0 kPa				
			s, inpart c	•	Catalyst heating not active				
				ourposes	•	ECT @ cylinder block > -48° C			
			ımercial F	•	Set point change < n.a. RPM				
			ie of com	•	For time n.a. s And			tion in this	
				0/0/	Additional after dynamic conditions fulfilled:			100 Julitod	
				•	Gear switch not active (A/T only)	rW	AO _{IKEM} SS	Kat Mei Nago a	
				•	(A/T only)	_D 1d	.DA napen.		
				•	Accelerator pedal released by driver				
					•	Vehicle speed 0 km/h			
				•	For time not cali- brated s				

, Ac	
DTC / Monitor Strategy Scrip- Scrip- Description Old Value Secondary Parameters with Enable Conditions Seconda	Component Di- agnostic Proce- dure
P050 Cold Start A Monitoring Cold Ide (Scheed Start Control Idle (SC) Function Monitoring Engine Speed set point > 200 RPM Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Performance e Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed of Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed on Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed on Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed on Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed on Integrated Ipart of idle speed control Ider in a. Integrated Ipart of idle speed on Integrated Ipart of Ipart of Ipart of Ipart of Ipart of Ipart of Ipart	- Check the Throttle Valve Control Module - GX3 - Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Diff. actual engine speed vs.	 General conditions: 			
		engine speed	Vehicle speed = 0 km/h			
		Integrated I- part of idle speed control-	 Accelerator pedal released by driv- er 			
		ler n.a.	Throttle actuator commanded on			
			 Evap purge flow < 8.0 kg/h 			
			Engine running			
		Nolkswagen AG	Time after engine Start not calibra- ted s			
	15	orisedby	Clutch switch n.a.	arantee		
	adurilessalv		Barometric pres- sure > 70.0 kPa	or accepted		
	of bermitte		Catalyst heating active	, and a second	liability	
holo	181		 ECT @ cylinder block > -10° C 		with respo	
rt or in w			Set point change n.a. RPM		ct to the	
, in pa			For time n.a. s		corre	
ourposes			dynamic conditions fulfilled:		ctness of	
Rercial F			Gear switch not active		f informa	
	noon		• (A/T only)		tionin	
	STEVILL TO TO		 Accelerator pedal released by driv- er 	SURE	This of	
	THACOS	orised by Volkswagen AG	 Clutch switch n.a. Barometric pressure > 70.0 kPa Catalyst heating active ECT @ cylinder block > -10° C Set point change n.a. RPM For time n.a. s Additional after dynamic conditions fulfilled: Gear switch not active (A/T only) Accelerator pedal released by driver Vehicle speed 0 km/h Engine load Solutions (M/T only) For time not calibrated s 	d'MgNygo, in		
			• (M/T only)			
			 For time not cali- brated s 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P050 B Cold Start Igni- tion Tim- ing Per- for- manc e	Ignition Control (IC) Ignition Timing Monitor @ Idle	Difference between commanded ignition timing efficiency vs. actual value > 20.0%	@ idle active			- Check the Throttle Valve Control Module - 36.34 Throttle Valve Control Module GX3, Checking", page 1169 Check for any engine speed sensor or ignition coil faults and diagnose them first. If no other codes are set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.	condition with respect to the correctness of information in this condition in this condition in this condition in the conditi
				7-0,	_{rogio1} q	. DA napeir.	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable AG. Vol Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Position Timing Over- Advance d Bank	Variable Valve Timing (VVT) Intake Actuator Rationality Check	• Camshaft position deviation > 9.90° CRK	Modeled oil tem- perature -40 – 160° C	• Once / DCY	2 DCY NAR) NAR NAR NAR NAR NAR NAR NAR	Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205,
P053 F Cold Start Fuel Pres- sure Per- for- manc e Bank 2	Cold Start Monitoring Fuel Sys- tem Out Of Range Low	 Deviation between set point and actual fuel pressure > 1,500.2 kPa For time >= 3.0 s 	 General: Engine speed > 608 RPM Time after engine start > 3.0 s Fuel mass set point lower range > 1.99 mg/rev For time >= 5.0 s 	• 5.0 s • Once / DCY	• 2 DCY (NAR)	Checking", page 1105. - Check the fuel pressure and delivery quantity. Re- fer to fuel system me- chanical test- ing in ⇒ "3.1 Pre- liminary Check", page 13 and/ or to appro- priate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Cold Start Monitoring Fuel Sys- tem Out Of Range High	Deviation between set point and actual fuel pressure < -1,500.2 kPa For time >= 3.0 s	 Fuel mass set point upper range <= 100.32 - 172.41 mg/rev Fuel mass set point gradient -1,389.0 - 2.2 mg/rev For time >= 1.2 s Additional for catalyst heating: Catalyst heating active ECT @ cylinder block > -48° C Fuel mass set point lower range >= 5.0 mg/rev For time >= 3.0 s 	n AG. Volkswag	en AG does not gua	- Check the Fuel Pressure Sensor-G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247. Checking". page 1131 Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276. Checking". page 1129.
P056 E Cold Start Tur- bo- charg- er/Su- per- charg- er Boost	Turbo- charger (TC) Boost Pressure Control Valve Cold Start Func- tional Check - Slow Re- sponse	Boost pressure actuator position controller output > 98.0% Boost pressure actuator position controller output < -98.0%	 Time after engine start >= 4.0 s ECT > -10° C AAT > -10° C Catalyst heating active Boost pressure control active 	• Continuous	• 2 DCY (NAR)	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 . Checking". page 1113 .
Con- trol "A" Per- for- manc e	Turbo- charger (TC) Boost Pressure Control Valve Cold Start Func- tional Check	Deviation boost pressure actuator position controller > 16.0 – 100.0%	 Time after engine start >= 4.0 s ECT > -10° C AAT > -10° C Difference between actuator position set point in normal mode and during catalyst heating > 0.0% Catalyst heating active Boost pressure control active 	4	SA negenedic	Turbocharg- er Recircula- tion Valve - N249 Refer to ⇒ "3.6.35 Turbocharg- er Recircula- tion Valve N249. Checking", page 1172 . Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P05A 0 Active Grille Air Shut- ter "A" Stuck On	Air Shutter	Blocked active grille air shutter detected Uncontrolled adjustment detected	• AAT n.a.° C	0.1 s Continuous	• 2 DCY (NAR)	- Check the Radiator Shutter Motor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Motor V544, Checking", page 1155.
P05A 2 Active Grille Air Shut- ter "A" Con- trol Cir- cuit/ Open	Active Grille Air Shutter Open Cir- cuit	lower range > 1.92 – 2.21 V • Signal voltage upper range < 2.85 – 3.25 V	riseatby Volkswagen AG. Volk	• 0.5 s	• 2 DCY (NAR)	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544 . Checking", page 1155 .
P05A 3 Active Grille Air Shut- ter "A" Con- trol Circuit Rang e/Per- for- manc e	Air Shutter Functional Check	Internal logic failure detected Initialisation failure detected		 0.1 s Continuous 0.0 s Continuous 24.0 s Continuous 	• 2 DCY (NAR)	Check the Radiator Shutter Motor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Motor V544 , Checking", page 1955 .
P05A 4 Active Grille Air Shut- ter "A" Con- trol Circuit High	Active Grille Air Shutter Short To Battery Plus	temperature > 160.0 - 200.0° C Or Signal current driver stage internal value	Dindno	• 0.5 s • Continuous	Copyright	- Check the Radiator Shutter Motor V544 Refer to %3.6.27
P05A 5 Active Grille Air Shut- ter "A" Con- trol Circuit Low	Active Grille Air Shutter Short To Ground	• Signal voltage < 1.92 – 2.21 V	 Recording time of signal voltage > 3.3 s Active grille air shutter feedback failure not detected 	O.5 S Continuous	2 DCY (NAR)	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544, Checking", page 1155.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P05C 0 Active Grille Air Shut- ter Mod- ule "A" Over Tem- pera- ture	Active Grille Air Shutter Functional Check	voltage detec-	ales sauthori	O.1 s Continuous	• 2 DCY (NAR)	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544 . Checking", page 1155	i de la
P0601 Inter- nal Con- trol Mod- ule Mem- ory Check sum Error	Engine Control Module (ECM): Checksum Verification	Calibration checksum incorrect Software checksum incorrect	es, inpart orin whole, is not be mited.	• 1.0 s • Continuous	• 2 DCY (NAR)	Replace the Engine Control Module - J623 - Refer to appropriate repair manual.	2
P0603 Inter- nal Con- trol Mod- ule Keep Alive Mem- ory (KAM) Error	Engine Control Module (ECM): Communi- cation Check	 Device 1: SPI communication with ATIC failure Device 2: SPI communication with ATIC failure SPI communication with ATIC failure 	Copyride of commercial purposes, in part or in whole, is not to the safety of the safe	• 2.0 s • Continuous	• 2 DCY (NAR)	- Replace the Engine Control Module - J623 Refer to appropriate repair manual.	Jula
	Engine Control Module (ECM): Fuel Injection Valves In- ternal Hard- ware Check	sion check during initiali- sation failure Calibration during initiali- sation failure Hardware during initialisa- tion failure		• Once / DCY			
		Time reference from microcontroller during initialisation missing Communication between microcontrol-		 2,880.0° CRK Continuous 4,320.0° CRK 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		ler and SDI- Driver power- stage failure		Continuous		
Con- trol Mod- ule	Barometric Pressure (BARO) Sensor En- gine Stand- ing: Cross Check	value to mean value (MAP mean value, BARO mean value, BARO @ ECM keep alive time) n.a. kPa • Diff. deviation MAP mean value to mean value (MAP mean value, BARO mean value, BARO @ ECM keep	 Case A: engine stop during DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle n.a. For time >= 10.0 s Case B: engine stop @ start of DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle n.a. 	• 3.0 s • Continuous	• 2 DCY (NAR)	- Replace the Engine Control Module - J623 Refer to appropriate repair manual.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Barometric Pressure (BARO) Sensor ECM Keep Alive-Time: Cross Check	 Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa 	 Vehicle speed < 1 km/h ECM keep alivetime 10.0 – 6,553.5 s Time after engine stop >= 5.0 s BARO sensor voltage 0.20 – 4.80 V MAP sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V 			
	Barometric Pressure Sensor Out Of Range Low	Measured barometric pressure < 45.0 kPa	olkswagen AG. Volkswagen • Engine running	• 5.0 s • Continuous		
	Barometric Pressure Sensor Out OF Range High	Measured barometric down pressure > 115.0 kPa	Olkews	"Ses not gu	Viantee of accept.	
	Knock Control Internal Hardware Check	Knock control malfunction: signal acquisi- tion error	Engine running	6.4 sContinuous	832	with re
	Engine Control Module (ECM): EE- PROM	EEPROM in- formation fail- ure		1.0 sContinuous		sspect to the co
	Check ni vsesodand leione	Decryption of NVMCrypt failed Finished		• 1.0 s • Once / DCY		rrectness of ir
	50	Finished NVMCrypt integrity error Communication between sample software and production hardware error			Heritoo jaantoo sa	respect to the correctness of information in the correctness of the co
	Engine Control Module (ECM): RAM Inter- nal Hard- ware Check	tected	• Reset counter > 1.0 [-]	• Once / DCY		

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		ECM: Random Access Memory (RAM) Functional Check	AG Volkswagen 4		• 0.01 s • Continuous		
isno _{tosinji}	ad unless auth	Engine Control Module (ECM): Analog / Digital Converter Function Monitoring: A/D Converter	• Diff. A/D- channel 1 vs. A/D channel 2 > 0.30 V	does not guarantee of acceptable	0.5 s Continuous		
or commercial purposes, in part or in whole, is not being, is not being.		Engine Control Module (ECM): Communi- cation Check	 SPI communication with ATIC failed SPI communication with ATIC implausible 		Continuous Correctness		
Jate or commercial F		Engine Control Module (ECM): Electronic Throttle	Monitoring of difference be- tween actual and set point torque value	Throttle actuator commanded on	• 05 s • Contin- uous		
8	4016UIAC	Control Module Function Monitoring: Torque	Engine torque overflow > 45.0 – 350.0 Nm Monitoring of torque difference of the second sec	commanded on	• 0.01 s		
			ence integration Integrated engine torque > 550.0 Nm		• Contin- uous		
		Engine Control Module (ECM): Electronic Throttle Control Module Function Monitoring: Engine Speed Limitation	• Engine speed > 1,760 RPM	 Engine speed limitation active Injection active 	0.5 s Continuous		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Engine Control Module (ECM): Electronic Throttle Control Module Function Monitoring: A/D Converter	Internal check failed	a C. Volkswa	0.5 s Continuous		
P0607 Con- trol Mod- ule Per- for-	Barometric Pressure (BARO) Sensor Short To Ground	sor voltage	by Volkswagen AG. Volkswa	• 0.5 ssno • Contin- uous	Sual (NAR)	 Replace the Engine Con- trol Module - J623 Refer to appropri- ate repair manual.
manc e	Barometric Pressure (BARO) Sensor Short To Battery Plus	Barometric pressure sen- sor voltage > 4.80 V				manual.
P0634 Control Module Internal Temperature "A" Too High	Turbo- charger (TC) Boost Pressure Control Over Tem- perature	Bypass valve driver temperature (hardware values) > 170 – 190° C	Control valve commanded on	0.4 sContinuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module J538 Refer to ⇒ 3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 .
Throt-	Throttle Actuator Adaptation Value Monitoring	age <= 9.04 V	 Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) active 	0.01 s Once per life ∀time	• 2 DCY (NAR)	 Check the Throttle Valve Con- trol Module - GX3 Refer to ⇒ "3.6.34
e/Per- for- manc e Bank 1	Throttle Actuator Adaptation Value Monitoring (Start Check)	Difference be- tween actual TPS 1 or 2 voltage and voltage refer- ence position > 0.07 V	 Throttle start check active Accelerator pedal value < 99.9% Engine speed < 64 RPM 	0.01 sOnce / DCY		Throttle Valve Con- trol Module GX3, Check- ing", page 1169.
		Difference be- tween actual throttle and reference po- sition > 0.503° TPS	 Vehicle speed < 2 km/h IAT > 5° C ECT 5 – 120° C 			

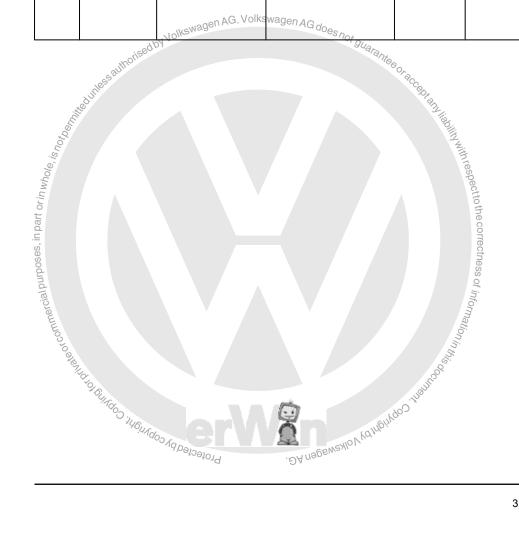
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Throttle Actuator Adaptation Value Monitoring (Top Limit)	Difference between actual throttle and reference position > 0.503° TPS Difference between actual TPS 1 or 2 voltage and voltage reference position > 0.07 V	activeAccelerator pedal value < 99.9%Engine speed <			
	Throttle Actuator Adaptation Value Monitoring (Bottom Limit)	Difference between actual throttle and reference position > 0.503° TPS Difference between actual TPS 1 or 2 voltage and voltage reference position > 0.07 V	• Vehicle speed < 2 km/h • IAT > 5° C • ECT 5 – 120° C	G. Volkswager	AG does not guara,	de e of accept and liability with respect to the
	Throttle Actuator Adaptation Value Monitoring (Mechanical Stop Low)	 TP\$1 voltage 0.40; > 0.80 TP\$2 voltage 4.20; > 4.60 				correctness of informa
	Throttle Actuator Adaptation Value Monitoring (Limp Home Position)	Difference be- tween actual TPS 1 or 2 voltage and voltage refer- ence position > 0.25 V	MAGO HELAGOS AG PODOSOS IN THE PROPERTY OF THE		Tupy Volkswagern	My Man Signature of the State o

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Throttle Actuator Adaptation Value Monitoring	 Accelerator pedal value > 99.9% Engine speed > 64 RPM Vehicle speed > 2 km/h IAT @ throttle < 5° C ECT @ cylinder block < 5° C ECT @ cylinder block > 120° C 	Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) active	0.01 s Once per life-time		
P0642 Sen- sor Refer- ence Volt- age "A" Circuit Low	Control Module (ECM): 5V Supply Volt- age Out Of Range Low	Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output 1 supply volt- age < 4.62 V Analog output age < 4.62 V age < 4.62 V age output Analog output age < 4.62 V age age < 4.62 V	kswagen AG does not guarar	0.2 s Continuous Recorded Adulting	• 2 DCY (NAR)	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
P0643 Sen- Sor Refer- ence Volt- age "A" Circuit High	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range High	• Analog output 1 supply voltage > 5.43 V	. DA nagenessio V vamb	• 0.2 s	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
	7.7,	Protected by copy	. DA nagswexhov your.			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0652 Sen- sor Refer- ence Volt- age "B" Circuit Low	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range Low	Analog output 2 supply volt- age < 4.62 V	nlessauthorised by Volkswagen	• 0.2 s • Contin- AG. WOUSvage	• 2 DCY (NAR)	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623. Refer to appropriate repair manual.
P0653 Sen- sor Refer- ence Volt- age "B" Circuit High	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range High	2 supply voltage age of interest of the supply voltage of the supp		• 0.2 s • Continuous	• 2 DCY (NAR)	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
Actua- tor Sup- ply Volt- age "A" Cir- cuit/ Open	nents Sup- ply Voltage Relay Open Circuit	 Output voltage lower range >= 1.90 - 2.30 V Output voltage upper range (hardware values) <= 2.80 - 3.20 V 	• Relay commanded off		OAnsgeweylov (VAK)	Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to \$\in\$ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145 .
P0658 Actua- tor Sup- ply Volt- age "A" Circuit Low	Engine Compo- nents Sup- ply Voltage Relay Short To Ground	Output voltage (hardware values) < 1.90 – 2.30 V	Relay commanded off	1.0 sContinuous	• 2 DCY (NAR)	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145 .

Actuator Supply Voltage ply Voltage Relay Short Voltage Plus PO686 Main Relay ECM/ PCM Relay Short To Ground PO687 Main Relay Short To Ground PO688 Main Relay Short To Ground PO689 Main Relay Short To Short T	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component agnostic Pro dure
ECM/ PCM Rationality Check Dur- Ing Engine Off Continuous Control Circuit Low Condition Control Circuit Low Condition Condition Control Circuit Low Condition Condition Control Circuit Low Condition Control Circuit Low Condition Condition Control Circuit Low Condition Continuous Continu	Actua- tor Sup- ply Volt- age "A" Circuit	Compo- nents Sup- ply Voltage Relay Short To Battery	driver stage internal value Actuator temperature (hardware values) > 175 –		• Contin-		Motronic I gine Cont Module P er Supply Relay - J271 Re
trol Circuit Low Short To Ground Short To Battery Plus Short To Battery Plus Short To Ground Short To Ground Short To Battery Plus Short To Ground Short To Ground Short To S	ECM/ PCM Power Relay	Rationality Check Dur- ing Engine	voltage > 6.0	manded off	Contin-		Motronic gine Cont Module P er Supply
ECM/ PCM Check Dury Check Dury Ing Engine Relay Control Corcuit High Rationality Check Dury Ing Engine Relay Control Short To Battery Plus Rationality Check Dury V Short To Battery Plus Rationality Check Dury V Short To Battery Plus Rationality Check Dury V Short To Short To Battery Plus Rationality Check Dury V Short To Shor	trol Circuit Low	Short To	age < 1.85 – 2.28 V (hard- ware values)	ded off For time > 40.0 ms	Continuous		Relay - J271 Ro to ⇒ "3.6.23 Motronic gine Cont Module P er Supply Relay J27 Checking page 114
trol Short To Circuit High Battery Plus High Short To Short To Eight Battery Plus High Short To Short To Short To High Battery Plus High Short To Short To Sh	ECM/ PCM Power Relay	Rationality Check Dur- ing Engine Running	V Voltage < 5.0 V	manded on gu	• Continuous		Motronic I gine Cont Module P er Supply
• Or • Main relay output current (hardware values) driver stage internal value **Relay Chec page** **Rep. Gr.ST - Generic Scan Tool **Modu er Su Relay Chec page** **Rep. Gr.ST - Generic Scan Tool **Modu er Su Relay Chec page** **Rep. Gr.ST - Generic Scan Tool	trol Short To	Short To	driver temper-	manded on For time >= 0.4 s	Continuous	an respect to the correctne	J271 Re to ⇒ "3.6.23

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0698 Sen- sor Refer- ence Volt- age "C" Circuit Low	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range Low	Analog output 3 supply volt- age < 4.62 V		• 0.2 s • Continuous	• 2 DCY (NAR)	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
P0699 Sen- sor Refer- ence Volt- age "C" Circuit High	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range High	Analog output 3 supply volt- age > 5.43 V Avolkswagen AG, Volks Avolkswagen AG, Volkswagen AG, Volks Avolkswagen AG, Volkswagen AG,	wagen AG does not	• 0.2 s • Continuous	• 2 DCY (NAR)	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.



tion	dure
P12A Fuel Rail 1 Pressure sor Ration- Press sure Sensor Inappro- priately Low P12 Pressure Sensor Inspect Sensor Inspect Sensor Inspect Inspect Sensor Inspect Inspect Sensor Inspect Inspect Inspect Sensor Inspect	Fuel Pressure Sensor-G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
2 Fuel Rail Pressure Sensor Inappropriate ly High	Fuel Rail Pressure (FRP) Sen- sor Ration- ality Check High	 Deviation lambda of controller included adaption > 30.0% High pressure controller output < -10 mg 	 General: Engine speed > 608 - 1,088 RPM Fuel mass set point 4.01 - 29.99 mg/rev Time after change to DFI not equipped s Time after engine start > 5.0 s Engine warm-up not calibrated Catalyst heating not calibrated Full load not calibrated Catalyst purge not calibrated Lambda control 		• 2 DCY (NAR)	- Check the Fuel Pressure Sensor - G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 , Checking", page 1131 .
to of pinate of commercial purposes in the whole, is not only the property of	se authorise aby Voll	swagen AG. Volkswage	 Catalyst purge not calibrated Lambda control closed loop AcEvap purge functionality diagnosis not active Depending on low dynamic conditions: Fuel mass set point lower range > 1.99 mg/rev For time >= 5.0 s Fuel mass set point upper range < 100.32 – 172.41 mg/rev Fuel mass set point gradient -1,389.0 – 2.20 mg/rev For time >= 1.2 s Depending on canister purge: Canister load <= 0.7 [-] 	ecttotl		
	YOY CODYTIGITE		Evap purge valve not active or closed			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable of A	Monitoring Time Cength	MIL Illumina- tion	Component Diagnostic Procedure
P13E A Cold Start Igni- tion Tim- ing Per- for- manc e Off Idle	Ignition Control (IC) Ignition Timing Monitor part Load	Difference be- tween com- manded igni- tion timing ef- ficiency vs. actual value > 12.0%	 Catalyst heating @ part load active Commanded ignition timing efficiency during catalyst heating <= 88.0% Engine part load Delta mass air flow set point not calibrated mg/rev Delta engine speed not calibrated RPM Vehicle speed > 2 km/h 	• 6.0 s • Once / DCY	• 2 DCY (NAR)	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 Refer to appropriate repair manual.
	Throttle Actuator Out Of Range Throttle Actuator Rationality Check	Control duty cycle > 98.0% Difference between throttle position set point and throttle flap opening angle for electronic throttle control > 2.998 – 24.982° TPS	or after detection of throttle ex- change or check- sum error) not ac- tive	O.7 s Continuous O.5 s Continuous O.5 s Continuous	• 2 DCY (NAR) (NAR	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169.
	Airbag Safety Measures Due To Crash With Airbag Activation	Airbag(s) activated		• 0.0 s • Continuous	• 2 DCY (NAR)	- After proper repair of damage, erase the Engine Control Module - J623- DTC. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21.

			Volks		107	0
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P169 A Load- ing Mode Active	Engine Control Module (ECM): Transport Mode Function Monitoring: Mode Change	mode active or in whole, is not be seen to b	 Vehicle speed < 5 km/h Max trip mileage since initial vehicle start-up < 100.0 km During ECM keep alive-time after ignition off Engine speed 0 RPM Production mode not active For hybrid: Drive motor off 	• 0.01 s • Continuous	• 1 DCY (NAR)	- Vehicle is in Transport Mode (Loading Mode). It can be turned off with a scan tool or will automatically switch off after approximately 100 km (62.15 miles) have accumulated on the vehicle. May need to perform readiness check. Refer to \$\times\$ "3.2 Readiness Code", page 14.
P2004 Intake Manifold Runner Control Stuck Open Bank 1	Manifold	 Signal voltage > 1.89 V For time >= 1.5 s 	 Flap commanded off Time after engine start > 5.0 s 	• 0.2 s • Continuous	Q(NAR)	Check the Intake Manifold Runner Position Sensor - G336- Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336- Checking" page 1137 - Check the Intake Manifold Runner Control Valve - N316- Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316- Checking" page 1135

P2008 Intake Intake Manifold Name Fortime >= Flap commanded on 0.2 s 0.2 s	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2008 Intake Manifold Manifold Runner Control Contr	Intake Manifold Runner Control Stuck Close d Bank	Manifold Runner Control (IMRC) Ac- tuator Stuck	< 3.10 V • For time >= 1.5 s	on Time after engine start > 5.0 s	Continuous	(NAR)	take Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137. - Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", Checking",
494 Rep. Gr.ST - Generic Scan Tool Palagold Sylvation No.	Intake Manifold Runner Control Circuit/ Open Bank	Manifold Runner Control (IMRC) Ac- tuator Open	Alter of Elingo His			···ellonin	fold Runner Position Sensor - G336 Refer to ***********************************

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2009 Intake Mani- fold Run- ner Con- trol Circuit Low Bank 1	Manifold Runner Control (IMRC) Ac- tuator Short To Ground	Output volt- age (hard- ware values < 1.92 – 2.21 V	Engine running Actuator commanded off	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135 Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor - G336, Checking", page 1137.
Manifold Runner Control Circuit High Bank 1	Intake Manifold Runner Control (IMRC) Actuator Short To Battery, See Plus	Power stage temperature > 160 - 200° C Or Magen AG. Vol Output current (hardware values) driver stage internal values	Engine running Actuator commanded on Kswagen AG does not guaran The state of	• 2.0 s • Continuous .	• 2 DCY (NAR)	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316 , Checking", page 1135 Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336 , Checking", page 1137 .
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		Protected by co.	Nolkewagen AG.		3. Diagi	nosis and Testing 4

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2014 Intake Mani- fold Run- ner Posi- tion Sen- sor/ Switc h Cir- cuit Bank 1	Intake Manifold Runner Control (IMRC) Ac- tuator Short To Ground / Open Cir- cuit	Intake manifold runner flap position sensor voltage < 0.20 V	Engine start not active	0.04 s Continuous	• 2 DCY (NAR)	- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336. Checking", page 1137 .
)(e, is p	Somiled unless authoriseed by V	_{Olks} wagen AG. Volkswagen	AG does not gua	Arantee Oracle Pranting	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.
P2017 Intake Manifold Runner Position Sensor/ Switc h Circuit High Bank	Manifold Runner Control (IMRC) Actuator Short To Battery	• Intake manifold runner flap position sensor voltage > 4.80 V	Engine start not active	• 0.04 s • Continuous	(NAR)	take Manifold Runner Position Sensor - G336 Refer to **3.6.19 In- take Manifold Runner Position Sensor
		* BUILDOS HABILINGOS /	G. Protected b.	n nolkenisgen A	Helitoo jaanoo sa	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.

		umorised by Voll	_{kswage} n AG. Volkswage	en AG does not guarantee	Generic S	Jetta/Bo Scan Tool - Ed	eetle 2013 ➤ (ition 12.2017
,	DTC/ De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
commercial purposes, in part or in whole, is no	P2088 "A" Cam- shaft Position Actuator Control Circuit Low Bank	Valve Tim-	• Output voltage (hardware values) < 1.92 – 2.21	Actuator commanded off Actuator commanded on	• 2.0 the correctness of information in this occurrence with the confidence of the c	• 2 DCY (NAR)	- Check the Camshaft Position Sensor - G40 - Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 . - Check the Camshaft Adjustment Valve 1 - N205 - Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 - Checking", page 1105 .
	P2089 "A" Cam- shaft Posi- tion Actua- tor Con- trol Circuit High Bank 1	Variable Valve Tim- ing (VVT) Intake Ac- tuator Short To Battery Plus	160 – 200° C	Actuator com- manded on	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 Check the Camshaft Adjustment Valve 1 -
							Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205, Checking", page 1105

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Post Cata-	Fuel System Out Of Range Low	*ov Adaption value < -0.05 [-]	 2nd lambda control n.a. Catalyst purge not active Injection mode change (DFI/MFI) not active Engine speed >= 704 RPM Counter of integrated mass for fuel in oil < 255.0 [-] Choice of: O2S rear (binary) check not active 	• 81.0 s	2 DCY (NAR) 2 DCY (NAR) 2 DCY (NAR)	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. Check the Oxygen Sensor 1 After Catalytic
Commerc	Fuel Sys-	1 _{doo} ng pagago	O2S rear (binary) check finished	Mykoo ing may a sa s	rmation	Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
P2097 Post Cata- lyst Fuel Trim Sys- tem Too Rich Bank 1	Fuel Sys- tem Out Of Range High	Adaption value > 0.05 [-]	 2nd lambda control n.a. Catalyst purge not active Injection mode change (DFI/MFI) not active Engine speed >= 704 RPM Counter of integrated mass for fuel in oil < 255.0 [-] Choice of: O2S rear (binary) check not active O2S rear (binary) check finished 	• 81.0 s • Continuous	• 2 DCY (NAR)	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	tuator Open	Electronic throttle valve driver load resistance > 200.0 kΩ	 Difference between measured and filtered throttle position <= 119.50° TPS Throttle actuator commanded off 	• 0.1 s • Continuous	• 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169
tle Ac- tuator "A"	tuator Over Tempera- ture	Electronic throttle valve driver temperature (hardware values) > 170.0 - 190.0° C Gen AG. Volkswagen AC	• Throttle actuator commanded on	• 0.1 s • Continuous	• 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
P2103		Electronic throttle valve driver current (hardware values) driver stage internal value	Throttle actuator commanded on	0.1 s • Continuous • Continuous	• 2 DCY (NAR)	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169 .
Sen- sor/ Switc	Accelerator Pedal Posi- tion (APP) Sensor 1 Out Of Range Low	• Signal voltage sensor 1 < 0.39 V	GEWENIO V VOTIBILIDO	• 03 s • Contin-	• 2 DCY (NAR)	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2123 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "D" Circuit High	Accelerator Pedal Posi- tion (APP) Sensor 1 Out Of Range High	Signal voltage sensor 1 > 4.86 V		• 0.3 s • Continuous	• 2 DCY (NAR)	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 1101 .
		Signal voltage sensor 2 < 0.19 V Volkswagen A Mithorised by Volkswagen B Mitho	.G. Volkswagen AG does not	• 0.3 s • Continuous	• 2 DCY (NAR)	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 1101 .
Throt- tle/	Accelerator Pedal Posi- tion (APP) Sensor 2 Out Of Range High	• Signal voltage sensor 2 > 2.80 V		• 0.3 s • Continuous	• 2 DAR) Of interpretation of the correctness of th	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .
Throt- tle/	Accelerator Pedal Posi- tion (APP) Sensor 1 and 2 Ra- tionality Check	• Difference between signal voltage sensor 1 and sensor 2 > 0.10 – 0.12 V	Olkswagen AG.	O.4 s Continuous	• 2 DCY (NAR)	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	P2177 Sys- tem Too Lean	Fuel System Direct Fuel Injection System Too Lean	• Adaptive val- ue >= 28.0%	Air mass > 60.0 mg/rey ECT @ cylinder block > 60° C	• 5.0 s • Continuous	• 2 DCY (NAR)	Check vac- uum lines visually for leaks.
notoernie	Off Idle Bank 1	@ Part Load		 IAT @ manifold > -48° C AAT > -48° C 	· Habilitywi		Check the intake system visually for leaks (false)
vhole, is,				• Lambda set point 0.92 – 1.05 [-]	threspe		air). - Check the
art or in _M				Lambda control closed loop	cttothec		fuel pressure and delivery quantity. Re-
poses, in p				Integrated air mass >= 5.0 – 200.0 g	orrectness		fer to fuel system me- chanical test- ing in
rcialpur				• Fuel mass 17.99 - 51.02 mg/rev	s of infor		⇒ *3.1 Pre- liminary
or commercial purposes, in part or in whole, is not be also in the commercial purposes. In part or in whole, is not be also in the commercial part of the commer				• Engine speed 1,280 – 4,000 RPM	tability with respect to the correctness of information in this or		Check", page 13 and/ or to appro- priate repair
*67.	101018			Low dynamic conditions:	8		manual. — Check the
	Justos	JUGUNGOD AG POPOS	Prote Prot	Diff. engine speed vs. averaged engine speed for engine speed dynamic detection < 100 – 175 RPM			Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127
				Diff. air mass vs. averaged air mass for load dy- namic detection < 30.01 – 60.0 mg/ rev			 Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Re-
				Diff. between reference and actual fuel pressure, high side not calibrated kPa			fer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10,
				 Integrated air mass > 5.0 g 			Checking", page 1152
				Evap purge valve closed			Check the Fuel Delivery
				• Canister load <= 1.20 [-]			Unit - GX1- / Fuel Pump Control Mod-
				Evap purge flow at max. value			ule - J538 Refer to ⇒ "3.6.13
				Dependence on canister purge min:			Fuel Delivery Unit GX1 / Fuel Pump Control Module J538,

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Lower limit of lambda controller output n.a. 			Testing", page 1125
			Upper limit of lambda controller output n.a.			Check the In- take Mani- fold Sensor - GX9 Refer
			Evap purge flow at min. value Wagen AG. Volksw Wagen AG. Wagen AG. Volksw Wagen AG. Wagen AG. Wagen AG. Volksw Wagen AG. Wagen AG. Wagen AG. Wagen AG. Volksw Wagen AG. Wagen AG	^{agen} AG doos		to
		itedunless authorise	dbyVolks	Sesn	ot guarantee or accept	- Check the Fuel Pres- sure Regu- lating Valve - N276 Refer to
		r In whole, is not being	at min. value			to ⇒ "3.6.15 Fuel Pressure Regulator Valve N2₹6, Checking", page 1129.
		purposes, in part		7		ne correctness of
		r piwate or commercia				nformation in this ode.
		Copyright of Commercial purposes, in part of the	Protected by COAD	DA nagawax	IO VALIMBINGO TRAN	page 1129 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
scrip- tion		• Adaptive value <= -25.0%	Conditions Air mass > 60.0 mg/rev ECT @ cylinder block > 60° C IAT @ manifold > -48° C AAT > -48° C Lambda set point 0.92 - 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 - 200.0 g Fuel mass 17.99 - 51.02 mg/rev Engine speed 1,280 - 4,000 RPM Low dynamic conditions: Diff. engine speed for engine speed dynamic conditions: Diff. air mass vs. averaged engine speed for engine speed dynamic detection < 100 - 175 RPM Diff. air mass vs. averaged air mass for load dynamic detection < 30.01 - 60.0 mg/rev Diff. between reference and actual fuel pressure, high side not calibrated kPa Integrated air mass > 5.0 g Evap purge valve closed Canister load <= 1.20 [-]	• 5.0 s • Continuous	• 2 DCY (NAR)	dure - Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/ or to appropriate repair manual. - Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
			min:			⇒ "3.6.20 In- take Mani- fold Sensor

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Lower limit of lambda controller output n.a. Upper limit of lambda controller output n.a. Evap purge flow at min. value 			GX9, Checking", page 1139. - Check the Fuel Pressure Regulating Valve - N276 - Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2181 Cool- ing Sys- tem Per- for- manc e	Engine Cooling System Cooling System Perform- ance Not In The Expected Range	• Cooling system temperature too low < 61 – 76° C	Modeled ECT > 61 - 76° C ECT @ first start > -10° C ECT @ first start < 42 - 57° C Min. AAT > -10° C At time of fault decision: Ratio fuel cut off <= 10.2% Ratio maximum vehicle speed > 120 km/h Ratio start-stop time <= 16.0% Ratio engine load time <= 39.8% For air mass flow ratio with max air mass flow < 2.5% For air mass flow ratio with max air mass flow > 40.0%			G83- Refer to ⇒ "3.6.10 Engine Cool- ant Temper ature Sensor On Radiator Outlet G83 Checking", page 1119 - Check the After-Run Coolant Pump - V51- Refer to ⇒ "3.6.2 After-Run Coolant Pump V51 Checking", page 1103 - Check the engine cool- ant thermo-

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2183 Engine Coolant Temperature Sensor 2 Circuit Rang e/Performanc e	Engine Coolant Tempera- ture (ECT) Sensor @ Radiator Outlet Cross Check	 Diff. ROT vs. IAT @ first engine start > 20 K (depending on engine off time) Diff. ROT vs. AAT @ first engine start > 20 K (depending on engine off time) Diff. AAT vs. IAT @ first engine start < 20 K (depending on engine off time) 	20 km/h For time > 20.0 s Diff. ROT vs. min. ROT @ condition < 4.5 K	• 100.0 s • Once / DCY	• 2 DCY (NAR)	- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking". page 1119 .
P2184 Engine Coolant Temperature Sensor 2 Circuit Low	Engine Coolant Tempera- ture (ECT) Sensor @ Radiator Outlet Short To Ground	• Sensor voltage <= 0.30 V		• Continuous	• 2 DCY • S (NAR)	⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83,
		in part in part of the property of the part of the par	Protected by copyright.	.ĐA neg	DEWSHO V LOTH BINGO	page 1119.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
En- gine	Engine Coolant Tempera- ture (ECT) Sensor @ Radiator Outlet Short To Battery / Open Cir- cuit	Sensor voltage > 4.90 V Sensor voltage > 4.90 V Sensor voltage of the sense	• IAT @ throttle >= -33° C • Time after engine start > 60.0 s	volk Contination volumes	uoes not guarantee	Engine Coolant Temperature Sensor On Radiator Outlet G83 Checking Dage 1119 Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62 Checking"
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2187 Sys- tem Too	tem Direct Fuel Injec- tion System	Case 1:Adaptive value >= 2.40 mg/rev	 Air mass > 60.0 mg/rev ECT @ cylinder block > 60° C 	• 5.0 s • Continuous	• 2 DCY (NAR)	Check the vacuum lines visually for leaks.
P2187 Sys- tem	Fuel System Direct Fuel Injection System Too Lean	Case 1:Adaptive value >= 2.40	 Air mass > 60.0 mg/rev ECT @ cylinder block > 60° C IAT @ manifold > -48° C AAT > -48° C Lambda set point 0.92 - 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 - 200.0 g Vehicle speed < 6 km/h Low dynamic conditions: 	• 5.0 s • Continuous	(NAR)	Check the vacuum lines visually for
			range not calibrated mg/rev Engine speed 704 – 992 RPM Engine n.a.	Diyugoo Aqpe	BLM BLM	GX10 Refer to "3.6.26 Oxygen Sensor 1 Before Catalytic Converter
			Evap purge valve closedCanister load <= 1.20 [-]			GX10 , Checking", page 1152 .

				3/2		
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
mercial purposes, in part or in whole .	Woodous The state of the sta	Protected by Old	Evap purge flow at max. value Depending on canister purge min: Lower limit of lambda controller output n.a. Upper limit of lambda controller output n.a. Evap purge flow at min. value	AMBURGO Juaturo	ability with respect to the correctness of <i>information in this or</i>	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve N276, Checking", page 1129.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Di- agnostic Proce- dure
Sys- tem	Fuel System Direct Fuel Injection System Too Rich @ Idle	Case 1: Adaptive value <= -2.8du mg/rev Case 2: Adaptive value n.a. kg/h Adaptive value n.a. kg/h	 Air mass > 60.0 mg/rev ECT @ cylinder block > 60° C IAT @ manifold > -48° C AAT > -48° C Lambda set point 0.92 - 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 - 200.0 g Vehicle speed < 6 km/h Low dynamic conditions: Diff. engine speed vs. averaged engine speed dynamic detection < 100 - 175 RPM Diff. air mass vs. averaged air mass for load dynamic detection < 30.01 - 60.0 mg/rev Diff. between reference and actual fuel pressure, high side not calibrated kPa Integrated air mass > 5.0 g Fuel mass upper range < 0.0 - 17.0 mg/rev Fuel mass lower range not calibrated mg/rev Engine speed 704 - 992 RPM Engine n.a. Evap purge valve closed Canister load <= 1.20 [-] 		• 2 DCY (NAR)	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. - Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking". page 1127. - Check the Oxygen Sensor 1 Before Catalytic Converter GX10 - Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking". page 1152. - Check the Fuel Delivery Unit - GX1 - Fuel Pump Control Module - J538 - Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 . Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 . Refer to ⇒ "3.6.20 Intake Manifold Sensor - GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor - GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor - GX9 - Refer to subject to the first testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer to subject testing in the fold Sensor - GX9 - Refer - GX10 - R
1	1	4	/ -			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions G. Volkswagen AG do	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		notised by Volkov	 Evap purge flow at max. value 	Nuarante .		GX9, Check- ing",
	. ked Urles sa		Depending on canister purge min:	Auarantee or accept	32.	page 1139 . - Check the Fuel Pres-
	is not born,		Lower limit of lambda controller output n.a.		ligh lift with	sure Regu- lating Valve - N276 Refer to
O. H. H.	6/04/4		 Upper limit of lambda controller output n.a. 		espect to th	⇒ "3.6.15 Fuel Pres- sure Regula- tor Valve
ses, in part	Description Description		Evap purge flow at min. value		e correctne	N276, Checking", page 1129.
OCATION 1	ie of commercial prices				ss of information in tha	 Check the EVAP Canis- ter Purge Regulator Valve 1 - N80 Refer to
	End of Bush	1 Tolected by Copyright, C	10/ke/nsdeu Ver	VOMBILGOD JIBA	tability with respect to the correctness of information in this eco.	⇒ "3.6.12 EVAP Canis- ter Purge Regulator Valve 1 N80, Checking", page 1123.

P2195 Oxygen Sensors (O2S) Front sor Signal Signal Bank Sensor 1 Soven Sor 1 Sun Stuck Lean Bank Sensor Signal Sensor Signal Bank Sensor Signal Sensor Si

P.2196 Oxygen (O2S) Front Sen- (O2S) Front Sen- (O2S) Front Signal Check - Up- Biase Blase Blase Blase Blase Rich Oxygen Inal Oxygen Inal Sor 1 P. Catalyst purge not active E. Engine speed > 1,152 RPM Exhaust gas temperature of O2S rear VOSS rear × 273. < 800° C Combustion mode not active E. Catalyst purge not active E. Engine speed > 1,152 RPM Exhaust gas temperature of O2S rear × 273. < 800° C Combustion mode not active E. Catalyst purge no
Dage 1123.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P219 C Cylin- der 1 Air- Fuel	Fuel System Predicted Adaptation Out Of Range Low	 Cylinder 1: Adaption value unweighted < -13.0% Cylinder 2: 	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] 	• Once /	• 2 DCY (NAR)	Check the spark plugs visually for signs of fouling.
Ratio Imbal- ance		Adaption val-	 Catalyst heating not active wagen AG Fuel cut off not active 	does not guaran,	90	Check the intake system visually for leaks (false air).
) to 6777;	• Adaption value unweigh-	 Lambda set value 0.97 – 1.03 [-] Catalyst heating not active wagen AG Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure not calibrated kPa Mass fuel flow set point 12 0 – 29 99 		SO, acceptany librilling	Check the fuel pressure and delivery quantity. Refer to fuel
	in part or in whole, is not been in part or in whole, is not been,	Adaption val- ue unweigh- ted < -13.0%	mg/rev		William	liminary Check",
	Ipurposes, inpa		 Segment adaptation completed Lambda control closed loop Catalyst purge 			page 13 and/ or to appro- priate repair manual.
	are or commercial		 Catalyst purge not active Canister load <= 2.0 [-] No gear shift 		""ation in this	Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Check-
		FOR POLITICADO WELL AND THE PROPERTY OF THE PR	 For segments 90.0 [-] Segments after start not calibra- 	6046	A MODELLA CONTRACTOR OF THE PARTY OF THE PAR	page 1127 . - Check the Ignition Coils
		100/19 pc	ted [-] Time after engine start not calibrated s	N OIKENISO		with Power Output Stage . Refer to ⇒ "3.6.17 lg- nition Coils
			 Integrated mass air flow >= 0.75 – 7.0 kg Rough road not 			With Power Output Stage, Checking", page 1133.
			• Engine speed 1,248 – 2,816 RPM			<u>page 1100</u> .
			Dependence on oxygen sensor di- agnosis			
			Oxygen sensor dynamic diagno- sis finished n.a.			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
tion		 Cylinder 1: Adaption value weighted < -10.0% Cylinder 2: Adaption value weighted < -10.0% Cylinder 3: Adaption value weighted < -10.0% Cylinder 4: Adaption value weighted < -10.0% Cylinder 4: Adaption value weighted < -10.0% 	Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 2nd gear not active 3nd gear not active 4nd gear active 5nd gear active 5nd gear active 6nd gear active 8nd gear not active Bnd gear not active Bnd gear not active Dynamic engine active Limited dynamic conditions Dynamic MAF < 29.99 mg/rev Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0% Dynamic ignition angle < 0.10 [-] Additional conditions Misfire on currently lean shifted cylinder not detected	and liability with respect to the correctness of information in this contraction in this contraction in this contraction in this contraction in the contraction in this contraction in the contraction in t		
					3. Diagi	nosis and Testing

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P219 D Cylin- der 2 Air- Fuel	Fuel Sys- tem Predic- ted Adapta- tion Out Of Range Low	Cylinder 1:Adaption value unweighted < -13.0%	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] 	4 timesOnce / DCY	• 2 DCY (NAR)	Check the spark plugs visually for signs of fouling.
Ratio Imbal- ance		 Cylinder 2: Adaption value unweighted < -13.0% Cylinder 3: 	Catalyst heating not activeFuel cut off not active			 Check the intake system visually for leaks (false air).
		 Adaption value unweighted < -13.0% Cylinder 4: 	 ECT 60 – 143° C AAT >= -48° C Barometric pressure not calibrated kPa 			Check the fuel pressure and delivery quantity. Refer to fuel system me-
		Adaption val- ue unweigh- ted < -13.0%	 Mass fuel flow set point 12.0 – 29.99 mg/rev Segment adaptation completed 			chanical test- ing in ⇒ "3.1 Pre- liminary Check", page 13 and/
			tion completed Lambda control closed loop			or to appro- priate repair manual.
			 Catalyst purge not active Canister foad <= 2.0 [-] 	Volkswagen A	G does not guarante	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors
		illes de la companya	No gear shift For segments 90.0 [-]			37
		9, is not berm,	Segments after start not calibra- ted [-]			Check the Ig- nition Coils with Power Output
		nt or in whol	Time after engine start not calibra- ted s			Stage . Refer to ⇒ "3.6.17 dg- nition Coils"
		rposes, in pe	 Integrated mass air flow >= 0.75 – 7.0 kg 			With Power Output Stage . Checking"
		of purposes, in part or in whole, is not been	 Rough road not detected Engine speed 1,248 – 2,816 RPM 			page 1133. Information in this of the last the l
		Se Ald to Elli	Dependence on oxygen sensor di- agnosis			in a state of the
		.,,	Oxygen sensor dynamic diagnosis finished n.a.	·DAY.	ageweavo Volkswage	90°)



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DTC/ De- scrip-	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
scrip-	Description Sundo Reference of the Control of the		 Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 	Length Wild respect to the consess of information in this continues are the consess of information in this continues are the consess of information in this continues are the		dure
					3. Diagi	nosis and Testing 5

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De-Str		Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
E tem Cylin- ted A der 3 tion	wposes, in part or in whose	Adaption value unweighted < -13.0% Cylinder 2: Adaption value unweighted < -13.0% Cylinder 3: Adaption value unweighted < -13.0% Cylinder 4: Adaption value unweighted < -13.0%	 Catalyst heating not active Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure not calibrated kPa Mass fuel flow set point 12.0 – 29.99 mg/rev Segment adapta- 	Gen/Once / DCY ^{SS} no	• 2 DCY (NAR)	leaks (false air). - Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check".

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component D agnostic Proc dure
		Cylinder 1:	Oxygen sensor delay diagnosis			
		 Adaption value weighted 	finished n.a.			
		-10.0%	 Diagnosis at gear 			
		Cylinder 2:	1st gear not ac- tive			
		• Adaption val- ue weighted < -10.0%				
		Cylinder 3:	3nd gear not active			
		 Adaption value weighted 				
		-10.0%	5nd gear active			
		Cylinder 4:	6nd gear active			
		 Adaption value weighted 	7nd gear active			
		-10.0%	8nd gear not active			
			Limited dynamic conditions			
			• Dynamic engine speed < 75 RPM			
	cedbyVoll	_{SW} agen AG. Volkswage	Dynamic MAF < 29:99 mg/rev			
	authorise		request < 0.10 [-]	0,		
A POLITICAL DE LA POLITICA DEPUEDA DE LA POLITICA DEPUEDA DE LA POLITICA DE LA PO			lambda control < 5.0%	Oran liabili		
Q'io			• Dynamic ignition angle < 0.10 [-]	Kywith res		
			Additional conditions	specttot		
			 8nd gear not active Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29:99 mg/rev Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0% Dynamic ignition angle < 0.10 [-] Additional conditions Misfire on currently lean shifted cylinder not detected 	liability with respect to the correctness of information in this occupa		
				ss of inform		
10916				ation in this		
JIHO TO TOUT			, i	NICO Y		
	JOS ZUDINAGOS KAK		A negsweklo V vd inginyqo Ji			
		- _{*⊙⊕} jo]A	9A nap _e .,			

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P219 F Cylinder 4 Air- Fuel Ratio Imbalance Fuel System Predicted Adaptation Out Of Range Low	 Cylinder 1: Adaption value unweighted < -13.0% Cylinder 2: Adaption value unweighted < -13.0% Cylinder 3: Adaption value unweighted < -13.0% Cylinder 4: Adaption value unweighted < -13.0% 	 Sure not calibrated kPa Mass fuel flow set point 12.0 – 29.99 mg/rev Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start not calibrated [-] Time after engine 	• Once / DCY	• 2 DCY (NAR)	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check the fuel pressure and delivery quantity. Reverse and delivery quantity. Pre-liminary Check". page 13 and/or to appropriate repair manual. Check the Fuel Injectors. Refer to \$ "3.6.14 Fuel Injectors, Checking". page 1127. Check the Ignition Coils with Power Output Stage. Refer to \$ "3.6.17 tg-nition Coils with Power Output Stage. Checking". page 1133.

Cylinder 1: Adaption value weighted < -10.0% Cylinder 2: Adaption value weighted < -10.0% Cylinder 3: Adaption value weighted < -10.0% Cylinder 4: Adaption value weighted < -10.0% Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic engine speed < 75 RPM Dynamic engine speed < 75 RPM Dynamic mider engine speed < 75 RPM Dynamic window lambda control < 5.0% Dynamic in control < 5.0%	DTC / Monitor De- Strategy scrip- tion	Monitor Strategy Description Malfunction teria and The		Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Proce
DA nageweallo V volteringo o into into o o o o o o o o o o o o o o o o o o	astilite duras sautronis ed by V	 Adaption ue weigh -10.0% Cylinder : Adaption ue weigh -10.0% 	delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 2nd gear not active 3nd gear active 4nd gear active 5nd gear active 6nd gear active 8nd gear not active Limited dynamic conditions Dynamic engine Aspeed < 75 RPM Dynamic MAF < 29.99 mg/rev Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0% Dynamic ignition angle < 0.10 [-] Additional conditions Misfire on currently lean shifted cylinder not detected	ect to the correctness of information in this cooling		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
O2 Sen- sor Posi- tive	Oxygen Sensors (O2S) Front Open Cir- cuit Pump Voltage	Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 1.20 V	 O2S front (linear) ready O2S ceramic temperature > 785° C 	• 2.3 s • Continuous	• 2 DCY (NAR)	- Check the Oxygen Sen- sor 1 Before Catalytic Converter - GX10 Re-
Cur- rent Con- trol Cir- cuit/ Open	(VIP)	Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) <= 1.20 V	• For time >= 10.0 s			fer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10,
Bank 1 Sen-		Choice of:				Checking", page 1152
sor 1		Nernst volt- age (VN) > 4.40 V				<u>page 1102</u> .
		Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V				
		Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) < -2.35 V	oriseatby Volkswagen AG	. Volkswagen A	G does not guarant	
		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) > 1.60 V	authorised by Volkswagen AG			d of the correctness of information in this cocuration in the correctness of information in the cocuration in the cocura
		Diff. pernst voltage (VN) vs. virtual ground volt- age (VG) < -0.40 V				th respect to the corr
		Pump current driver stage internal value				ectness of
		Measurement O2S front label resistor n.a. Ω				information in th
		* All de de la	Protected by Copyright; Copyright	.5A	Nokswagen	Koo jishtoo s

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
O2 Sen- sor Refer- ence	Oxygen Sensors (O2S) Front Open Cir- cuit Nernst Voltage	Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 1.20 V	 O2S front (linear) ready O2S ceramic temperature > 785° C 	2.3 sContinuous	• 2 DCY (NAR)	- Check the Oxygen Sen- sor 1 Before Catalytic Converter - GX10 Re-
Volt- age Cir- cuit/ Open Bank 1 Sen-	(VN)	 Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) <= 1.20 V 	• For time >= 10.0 s			fer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10,
sor 1		Choice of:				Checking", page 1152
		Nernst volt- age (VN) > 4.40 V				
		Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Magen	AG. Volkswagen AG doc			
	ili dulless	Diff pump voltage (VIP) vs. virtual ground voltage (VG) < -2.35 V	AG. Volkswagen AG does no	guarantee or acce	Dr. Andrews	
	art or in whole, is not bermited in the second of the seco	Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) > 1.60 V			denyliability with respect to the correctness of information in this country.	
	oling to pinate of commercial purposes, in part o	Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) < -0.10 V			he correctness of in	
	commercii	 Pump current driver stage internal value 			lformation in	
	O BEALD TO BURG	Measurement O2S front label resistor n.a. Ω		¹ kg;	TH. B.	
		Protected by copyright.	JA NOBSWEYI	Verneine		

DTC / De-	Monitor	Malfunction Cri- teria and Thresh-	Secondary Parameters with Enable	Monitoring MIL Illumin	
scrip-	Strategy Description	old Value	Conditions	Length Lion	agnostic Proce- dure
O2 Sen- Sega- tive Curt Con- troic cuit	Oxygen Sensors (O2S) Front Open Cir- cuit Virtual Ground (VG)	Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 2.35 V Diff. pump voltage (VIP)	 O2S front (linear) ready O2S ceramic temperature > 785° C For time >= 10.0 s driver stage internal value 	• 2.3 s • Continuous • Continuo	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
	* Elucio 746	vs. virtual ground volt- age (VG) < -2.35 V Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) > 1.60 V	. DA Nolkswagen A.G.	pintgo ins	
		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) < -0.10 V			
		Pump current driver stage internal value			
		Measurement O2S front la- bel resistor n.a. Ω			
		Choice of:			
		Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) <= 1.20 V			
		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) <= 1.20 V			
		Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 1.20 V			

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	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
hole, isnotbe.	ill side		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) > 1.20 V	\$0,0	A liability with resp		
or commercial purposes, in part or in w	P2257 AIR System Control "A" Circuit Low	Secondary Air Injection (AIR) Pump Relay Short To Ground Secondary Air Injection (AIR) Pump	Output voltage (hardware values) < 1.92 – 2.21 V	Engine running Actuator commanded off Actuator commanded off Engine running Actuator com-	• 0.5 s	• 2 DCY (NAR)	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157 .
	P2258 AIR System Control "A" Circuit High	Secondary Air Injection (AIR) Pump Relay Short To Battery Plus	Actuator temple perature > 160 - 200° C Output current (hardware values) driver stage internal value	Engine running Actuator commanded on	• 0.5 s • Continuous	• 2 DCY (NAR)	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.

		ised by		Suaran	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illumina- Time tion Length	Component Diagnostic Procedure
Tur-bo-charg-er/Su-per-charg-er By-pass Valve "A" - Me-chanical	Turbo- charger By- pass (FCBY) Functional Check: Stuck Close	PUT n.a. kPa*s • Case 2:	 External torque request not demanded IAT @ throttle > -11° C Barometric pressure > 73.0 kPa Intake overpressure protection not active Active turbocharger protection leading to opening of the waste gate not active Activations conditions: Recirculation actuator position set point 100.0% Time since last valve closed activation > 1,200 ms Gradient accelerator pedal value <= -97.70%/s Max boost pressure variation <= 50.0 kPa 		
Tur- bo- charg- er/Su- per-	Turbo- charger (TC) Posi- tion Sensor First Adap- tion Moni- toring: Functional Check	No adaption of boost pres- sure actuator sensor in ac- tual driving cy- cle (no previ- ous adapta- tion occurred)		• 0.0 s • Once / DCY	- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 - Checking", page 1172 - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 - Checking", page 1113

DTC / Description	nt Di- roce-
P2270 Oxygen O2 Sensors Sensors Sensors Sensors Signal Sig	Sen- iter - cer - Refer <u>5</u> Sen- iter cer heck-

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Lambda adaption not active			
			 Valve lift not equipped 			
			Temperature conditions:			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) > -48° C			
			 Modeled catalyst temperature once after engine start > 550° C 			
		s sauthorised b	Modeled catalyst temperature @ start of diagnosis 500° C	n AG does not g	Liarantee Oraco	
		illing to the state of the stat	 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 		CED AND	William W.
	ut orin who _{le} .		 Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g 			threspect to the
	rajal purposes, in pe	and the state of t	 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 K 			correctness of info
	É	ELOS TO STRAIL OF	 ~~ Signal (tans) > -48° C Modeled catalyst temperature once after engine start > 550° C Modeled catalyst temperature @ start of diagnosis 500° C Modeled catalyst temperature during diagnosis 470 - 730° C Integrated air mass, catalyst temp. conditions fulfilled not calibrated g Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 - 254.0 K Diff. between dynamic and stationary catalyst temperature during diagnosis -304.0 - 304.0 K Modeled EGT @ O2S front <= 1,201° C Air mass @ start of diagnosis Air mass @ start of diagnosis Air mass @ start of diagnosis 		iautos	mation in this
		146 _U Ado	• Modeled EGT @ O2S front <= 1,201° C	AONEMAR	la Monigos, *	
			Air mass condi- tions	∂A n _{9no} .		
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/rev 			
			Air mass during diagnosis not calibrated mg/rev			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h				
			MAF per cylinder during diagnosis 35.0 – 135.0 kg/h				
			Load conditions:				
			Air mass set point 125.01 – 580.0 mg/rev				
			Engine load not calibrated, % Nest and called the	en AG. Volkswa	igen AG does not g	Va.	
			 Load conditions: Air mass set point 125.01 – 580.0 mg/rev Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated s Low dynamic conditions 			dfantee Oraccelor	
			For time not cali- brated s			PAZ IRO	
		ole, is not	Low dynamic conditions			ZWIII	397
		or in wh	Dynamic engine speed < 20 RPM				pecttou
		s, in part	Dynamic air mass < 25.01 mg/ rev				leconec
		or commercial purposes, in part or in whole, is not bearing.	Dynamic lambda controller output <= 20.0%				uless of info
		20	are fullilled > 20.0			White the state of	mst
			• Evap purge con- ditions: Case 1	70.00	Ö	1900 Juguin	
			Evap purge valve not calibrated Case 2:	PAV.	10/KSMSHOT	19 July 10 Jul	
				^D d	.DA (IADO)		
			Canister load cal- culation not cali- brated				
			Evap purge flow not calibrated				
			• Case 3:				
			Canister load not calibrated [-]				
			Evap purge flow not calibrated				
			Close the gap conditions				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			O2S rear voltage @ diagnosis start >= 0.55 V			
			 Integrated air mass @ start di- agnosis not cali- brated g 			
			O2S front dynamic diagnosis separate not active			



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2271 O2 Sen-sor Signal Biase d/ Stuck Rich Bank 1 Sen-sor 2	Strategy Description Oxygen Sensors (O2S) Rear Signal Range Check	teria and Thresh-	 ters with Enable Conditions General conditions Vehicle speed >= 10 km/h BARO not calibrated kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S heater rear active O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s 	• 86.5 s • Once / DCY	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
			0.25 [-]Coasting function not active			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Lambda adaption not active			
			Valve lift not equipped			
			Temperature conditions			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) > -48° Č			
			Modeled catalyst temperature once after engine start > 550° C	olkswagen 4 c		
		os sali	Modeled catalyst temperature @ start of diagnosis 500 – 700° C	en agon AG	oes not guarantee o	***
			Modeled catalyst temperature dur- ing diagnosis 470 – 730° C			Soran libelity
		art or in whole, is,	Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g			th respect to the t
		rcial purposes, in p	Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K			correctness of infon
		of the state of commercial purposes, in part or in whole, is not being the state of	 Diff. between dynamic and stationary catalyst temperature during diagnosis 304.0 – 304.0 K 			acceptern liability with respect to the correctness of information in this occupance.
		, A.O.	Modeled EGT at 0,02S rear <= 1,201° C		орундты у окъма	D Î
			Air mass conditions	.ĐA _{NĐI}	,	
			Air mass @ start of diagnosis 125.01 – 580.0 mg/rev			
			Air mass during diagnosis not calibrated mg/rev			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	and Conditions wagen A	Monitoring Time	MIL Illumina- tion	Component Diagnostic Procedure
		itiled unless authorised by Vs.	MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h	SUZIZI	nee of accept and list like with	
	Shotber		MAF per cylinder during diagnosis 35.0 – 135.0 kg/h		AliabilityMic	
	hole,		Load conditions:			resp
	n part or in whole, is not be seen in part or in whole, is not be seen to be seen the seen that the		Air mass set point 125.01 – 580.0 mg/rev			ect to the co
	oses, in p		Engine load not calibrated %			orrectnes
	ercial purk		Accelerator pedal value not calibra- ted %			S of Inform
	or comm		For time not cali- brated s		""On in th	12 s.
	×	SALID TO TO	• Low dynamic conditions		ISUROQ SE	
		11/400 ; 11	speed < 20 RPM		Copy	
		LADINADO VAN	Low dynamic conditions Dynamic engine speed < 20 RPM Dynamic air mass < 25.01 mg/stk Dynamic lambda controller output	W DAN OIKENSOE	William Control of the Control of th	
			Dynamic lambda controller output < 20.0%			
			Integrated air mass after dy- namic conditions are fulfilled > 20.0 g			
			Evap purge con- ditions:			
			Case 1			
			Evap purge valve not calibrated			
			• Case 2			
			Canister load cal- culation not cali- brated			
			Evap purge flow not calibrated			
			• Case 3			
			Canister load not calibrated [-]			
			Evap purge flow not calibrated			

				1		-
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Intake	(IA) System	Ratio adapted turbocharger boost pres-	modeled adapta	• 5.0 s	• 2 DCY (NAR)	Check for air leaks near the throttle
Air Sys- tem Leak	Rationality Check	boost pressure and actual turbo-charger boost pressure > 35.0% • Lambda correction included controller and adaption -50.0 – 50.0% Lambda controller active	inducted adaptation active (by turbocharger boost pressure) • Throttle position > 4.50° TPS • Engine speed 1,216 – 6,000 RPM • Pressure quotient @ throttle 0.63 – 0.90 [-] • Engine running • Fast throttle adaptation finished • MAP gradient -200.0 kPa/s • Fuel cut off not active • Time after engine start > 5.0 s • Boost pressure < 135.0 kPa • BARO 73.0 – 107.5 kPa		darantee or acceptant life	crankcase can set this fault as the PCV system is not metered. If a vacuum leak of crankcase seal is the cause, the idle may be rough or unstable. Check the Intake Manifold Sensor GX9 - Refer to \$\frac{3}{3}\) \$\frac{6}{3}\] \$\frac{6}{3}\] \$\frac{1}{3}\] \$\fra
						- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2300		Outgast or in whole, is not controlling the control of the co	• Engine speed >	G. Volkswagen	•	GX3, Checking", page 1169. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123.
Igni- tion Coil "A" Pri- mary Con- trol Circuit Low	Čoils Short To Ground	in on state driver stage internal value (hardware val- ues)	512 RPM • ECT @ cylinder block > -30° C	• Continuous	(NAR)	nition Coils with Power Output Stage . Refer to ⇒ "3.6.17 lg-nition Coils With Rower Output Stage . Checking", page 1133 .
P2301 Ignition Coil "A" Primary Control Circuit High	Ignition Coils Short To Battery Plus	Diagnosis_by_ side switch in A	inactingithtewspeed > ATIC512 RPM Paland in Othrigine stop not 5.28 5ct √ve	O.8 s Continuous	• 2 DCK (A)A	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		• Output temper ATIC in on sta 200.0° C	atur E.frogim e stop not le > alctioxe – • Actuator com- in omnatated on ternal value			
P2302 Igni- tion Coil "A" Sec- on- dary Circuit	Ignition Coils Open Circuit	Output voltage in off state lower range >= 1.92 - 2.21 V Output voltage in off state upper range <= 2.85 - 3.25 V (hardware values)	ECT @ cylinder block > -30° C Engine stop not active	 0.8 s Continuous 	• 2 DCY (NAR)	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2303 Igni- tion Coil "B" Pri- mary Con- trol Circuit Low	Ignition Coils Short To Ground	Output current in on state drive stage internal value (hardware values)	• Engine speed > 512 RPM • ECT @ cylinder	0.8 s Continuous	• 2 DCY %	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage Checking", page 1133
P2304 Igni- tion Coil "B" Pri- mary Con- trol Circuit High	Ignition Coils Short To Battery Plus	Side switch in a control of the	in Origine stop not 5.285ct/ve (es) • Actuator commanded off inacting interspeed > ATIC512 RPM ature from estop not (e) > actuator commin original value	• 0.8 s • Continuous	• 2 DCY (NAR)	- Check he Ignition Coils with Power Output Stage . Refer to ⇒ 3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 .



	Jule			- 1			
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina-	Component Diagnostic Procedure	
P2305 Ignition Coil "B" Secon- dary Circuit	Ignition Goils Open Circuit	 Output voltage in off state lower range >= 1.92 - 2.21 V Output voltage in off state upper range <= 2.85 - 3.25 V (hardware values) 	 ECT @ cylinder block > -30° C Engine stop not active 	• 0.8 s • Continuous	OF Ret to the correctness of information	 Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage , Checking", page 1133 . 	
P2306 Ignition Coil "C" Primary Control Circuit Low	Ignition Coils Short To Ground	Output current in on state driver stage internal value (hardware values) Output current in on state driver stage internal value (hardware values)	512 RPM	O.8 s Continuous NAGINGUINGOO THE	• 2 DCY (NAR)	 Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 . 	
P2307 Igni- tion Coil "C" Pri- mary Con- trol Gircuit High	Ignition Coils Short To Battery Plus	Side switch in A Output voltage state > 4.95 – 9 (hardware value) Diagnosis_by_side switch in A Output tempera ATIC in on state 200.0° C	in Offrigine stop not 5.285ct/ve es) • Actuator commanded off inactive_intervspeed > ATIC512 RPM ature_frigine stop not e > actuator comin omatated on ernal value	0.8 s Continuous	• 2 DCY (NAR)	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .	
P2308 Igni- tion Coil "C" Sec- on- dary Circuit	Ignition Coils Open Circuit	Output voltage in off state lower range >= 1.92 - 2.21 V Output voltage in off state upper range <= 2.85 - 3.25 V (hardware values)	 ECT @ cylinder block > -30° C Engine stop not active 	0.8 s Continuous	• 2 DCY (NAR)	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .	

		an roor Edition 12		aen	AG. Volkswagen A	O .
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions		MIL Illumina- tion	Component Diagnostic Procedure
	Ignition Coils Short To Ground	Output current in on state driver stage internal value (hardware val- ues)	• ECT @ cylinder	• 0.8 s • Continuous	• 2 DCY (NAR)	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
			"ACTO BILLAGO WARMA	Protected by co.	.DAr	BBBWSMOV VOT MENT GOO

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
scrip-			 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] Catalyst heating not active Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure not calibrated kPa Mass fuel flow set point 12.0 – 29.99 mg/rev 	• 4 times • Once / DCY	• 2 DCY (NAR)	dure - Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127. - Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10.
		orivate or commercial purposes, in part or in whole, is not be in the second of the se	 Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] 			Checking", page 1152. - Check the Oxygen Sensor 1 After Catalytic Converter - GX7 - Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7 , Checking", page 1149.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Oxygen sensor delay diagnosis finished n.a. 			
			Diagnosis at gear			
			1st gear not ac- tive			
			2nd gear not active			
			3nd gear not active			
			4nd gear active			
			5nd gear active			
			6nd gear active			
			7nd gear active			
			8nd gear not active			
			Limited dynamic conditions			
			Dynamic engine speed < 75 RPM Sylvage Dynamic engine Dynamic engine Sylvage Dynamic engine Dynamic eng	n AG. Volkswag	en AG does s	
			Dynamic MAF < 29.99 mg/rev		Shot gue	rantee
		à	• Dynamic torque request < 0.10 [-]			of accept an
		040	Dynamic window lambda control < 5.0 %			rantee of accept and liability with response
		thole, is,	Dynamic ignition angle < 0.10 [-]			Vith respe
		art or in _v	 Additional conditions 			CHOUSE
		purposes, in pa	 Cylinder balancing diagnosis of all cylinders active 			901000000000000000000000000000000000000
		onware or commercial	 Pynamic tolque request < 0.10 [-] Dynamic window lambda control < 5.0 % Dynamic ignition angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active 		-DA negswealo V _V	Tomation in Bullion in

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Se	econdary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	B Cylin-	Fuel Sys- tem Misfire Monitoring Rationality	• Cylinder mis- fire counter > 10.0 [-]	•	Modeled catalyst temperature <= 900° C	4 timesOnce / DCY	• 2 DCY (NAR)	- Check the Fuel Injec- tors . Refer to ⇒ "3.6.14
	Air- Fuel	Check		•	Lambda set value 0.97 – 1.03 [-]			Fuel Injectors, Check-
	Ratio Imbal- ance -			•	Catalyst heating not active			<u>ing",</u> page 1127 .
	Ad- just- ment			•	Fuel cut off not active			 Check the Oxygen Sen- sor 1 Before
	At Limit			•	ECT 60 – 143° C AAT >= -48° C			Catalytic Converter -
	Dur- ing Bal- ance			•	Barometric pressure not calibrated kPa			GX10 Re- fer to ⇒ "3.6.26 Oxygen Sen-
	ith	hisedby Volkswag	en AG. Volkswagen AG	doe:	Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure not calibrated kPa Mass fuel flow set point 12.0 – 29.99 mg/rev Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start not calibrated [-]			sor 1 Before Catalytic Converter GX10
	Inless at			•	Segment adaptation completed			Checking", page 1152
ot pormit				•	Lambda control closed loop	o liki		Check the Oxygen Sen- sor 1 After
hole, isn,				•	Catalyst purge not active	with resp		Catalytic Converter - GX7 Refer
t orin w,				•	Canister load <= 2.0 [-]	With respect to the correctness of		to ⇒ "3.6.25
ss, in par				•	No gear shift For segments	correct		Oxygen Sen- sor 1 After Catalytic
purpose					90.0 [-] Segments after	tness of		Converter GX7 , Check- ing",
mercial					start not calibra- ted [-]	of information in 1		page 1149.
ivate or con		APINADO VA DOSO DE		•	Time after engine start not calibrated s	tioninthis		
	Ol Bulkdos			•	Integrated mass air flow >= 0.75 – 7.0 kg			
	ŕ	ADINACOD APPENDEN	DA NO.	• new	Rough road not detected			
		-+1	a	•	Engine speed 1,248 – 2,816 RPM			
				•	Dependence on oxygen sensor diagnosis			
				•	Oxygen sensor dynamic diagnosis finished n.a.			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
			 Oxygen sensor delay diagnosis finished n.a. 				
			Diagnosis at gear				
			1st gear not ac- tive	No.	agen AG. Volkswa	gen AG doo	
			2nd gear not active	orisedbyVolksv		ades not guarai	N _{OO}
			3nd gear not active				GOF RCCROP
			4nd gear active				17/18
			5nd gear active				
			6nd gear active				
			7nd gear active				
			8nd gear not active				
			Limited dynamic conditions				
			Dynamic engine speed < 75 RPM				
			Dynamic MAF < 29.99 mg/rev			Y /	
			Dynamic torque request < 0.10 [-]				, , , , , , , , , , , , , , , , , , ,
			Dynamic window lambda control < 5.0 %	20		Geu AG qoes not guara)	Mgo Jinghing
			Dynamic ignition angle < 0.10 [-]	ADITIVOD VO DOTO		M. D. A. OKENSBEILLE).).
			Additional conditions		1.~1d	.ĐA oz	
			 Cylinder balanc- ing diagnosis of all cylinders ac- tive 				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure				
C Cylin-	Fuel Sys- tem Misfire Monitoring	n Misfire fire counter > nitoring 10.0 [-]	fire counter >	fire counter >	fire counter >	fire counter >	fire counter >	fire counter > temperature <= 000 C (NAR)		 Check the Fuel Injectors . Refer to
der 3 Air- Fuel	Rationality Check		• Lambda set value 0.97 – 1.03 [-]		⇒ "3.6.14 Fuel Injec- tors , Check-					
Ratio Imbal- ance -			 Catalyst heating not active 			ing", page 1127				
Ad- just-	Ad- just- ment At Limit Dur-		 Catalyst heating not active Fuel cut off not AG active of the CT 60 – 143° C AAT >= -48° C Barometric preserves not collibrate. 	Volkswagen A	does not au	- Check the Oxygen Sen-				
At			active of the second of the se		ante suarante	Catalytic				
		165 ^E	• AAT >= -48° C			GX10 Re-				
Dur- ing Bal- ance		ial purposes, in part or in whole, is not bennited	 Barometric pres- sure not calibra- ted kPa 			fer to ⇒ "3.6.26 Oxygen Sen- sor 1 Before				
			 Mass fuel flow set point 12.0 – 29.99 mg/rev 			Catalytic Converter GX10				
			 Segment adaptation completed 			Checking page 1152				
			Lambda control closed loop			- Check the Oxygen Sensor 1 After				
			 Catalyst purge not active 			Catalytic Converter GX7 Refer				
			• Canister load <= 2.0 [-]		to ⇒ "3.6.25					
		2000	No gear shift			Oxygen Sen- sor 1 After				
		Seand of Build	• For segments 90.0 [-]			Catalytic Converter CX7, Check-				
			Segments after start not calibrated [-] Time after engine start not calibrated s	Vangin	ng", page 1149					
			Time after engine start not calibra- ted s	.ĐAn	, IOIKSMSJB					
			 Integrated mass air flow >= 0.75 – 7.0 kg 							
			 Rough road not detected 							
			• Engine speed 1,248 – 2,816 RPM							
			 Dependence on oxygen sensor di- agnosis 							
			 Oxygen sensor dynamic diagno- sis finished n.a. 							

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Oxygen sensor delay diagnosis finished n.a. 			
			Diagnosis at gear			
			1st gear not ac- tive			
			2nd gear not active			
			3nd gear not active			
			4nd gear active			
			5nd gear active			
			6nd gear active			
			7nd gear active	an AG	. Volkswagen 4	
			8nd gear not active	Volkswagen AG	- Son AG	loes not guarant
			Limited dynamic conditions			"Ce Or acce
			Dynamic engine speed < 75 RPM			
			• Dynamic MAF < 29.99 mg/rev			
			Dynamic torque request < 0.10 [-]			
			Dynamic window lambda control < 5.0 %			does not guarantes or acts
			Dynamic ignition			
			Additional conditions			
			angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active			
			tive			
	1		all cylinders active of the state of the sta	Profeofedby	.DAng.	т Сорийнгру Локемэй

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
D Cylin-	Fuel Sys- tem Misfire Monitoring	Cylinder mis- fire counter > 10.0 [-]	 Modeled catalyst temperature <= 900° C 	4 timesOnce / DCY	• 2 DCY (NAR)	- Check the Fuel Injec- tors . Refer to
der 4 Air- Fuel	Rationality Check		 Lambda set value 0.97 – 1.03 [-] 	DOT		⇒ "3.6.14 Fuel Injec- tors , Check-
Ratio Imbal- ance -			 Catalyst heating not active 			ing", page 1127
Ad- just-			 Fuel cut off not active 			Check the Oxygen Sen-
ment At			• ECT 60 – 143° C			sor 1 Before Catalytic
Limit Dur-			• AAT >= -48° C			Converter - GX10 Re-
ing Bal- ance			 Barometric pres- sure not calibra- ted kPa 			fer to ⇒ "3.6.26 Oxygen Sen-
			 Mass fuel flow set point 12.0 – 29.99 mg/rev 			sor 1 Before Catalytic Converter GX10 Checking", page 1152
			 Segment adaptation completed 			
			 Lambda control closed loop 	Vacen a c		Check theOxygen Sensor 1 After
			Catalyst purge not active O Volkswage			Catalytic Converter -
		:e8db)	• Canister load <= 2.0 [-]	n AG does not g	Ualia.	GX7 Refer to ⇒ "3.6.25
		e authoris	 No gear shift 		4ntegor	Oxygen Sensor 1 After
			• For segments 90.0 [-]	7	*CCOPT RATE	Catalytic Converter
		conmercial purposes, in part or in whole is not permitted by the series of the series	Segments after start not calibra- ted [-]			GX7, Checking", page 1149. Gying ing", page 1149.
	: or in whole		Time after engine start not calibra- ted s			
	ses, inpar		 Integrated mass air flow >= 0.75 – 7.0 kg 			e correctn
	al purpos		 Rough road not detected 			ess of in
	, and the state of	II comme	• Engine speed 1,248 – 2,816 RPM			formation in
		THOO TO BRAIL TO THOUSE OF	 Dependence on oxygen sensor di- agnosis 		illalinos	<i>b</i>
		1461Mdo	Oxygen sensor dynamic diagnosis finished n.a.	Tolkswas	Kampingos, *	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		to pinate or commercial purposes, in part or in whole, is not bennities,	 Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 2nd gear not active 3nd gear active 4nd gear active 6nd gear active 6nd gear active 7nd gear active 8nd gear not active 7nd gear active bynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/rev Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0 % Dynamic ignition angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active 	G. Volkswagen	AG does not guaran	codian liability with respect to the correctness of information in this document.
P2310 Igni- tion Coil "D" Pri- mary Con- trol Circuit High	Ignition Coils Short To Battery Plus	side switch in AOutput voltage	in O⊞n⊑gine stop not	O.8 s Continuous	• 2 DCY (NAR)	 Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		• Output temper ATIC in on star 200.0° C	atur Engine stop not le > action = • Actuator com- in om atated on ernal value			
P2311 Igni- tion Coil "D" Sec- on- dary Circuit	Ignition Coils Open Circuit	 Output voltage in off state lower range >= 1.92 - 2.21 V Output voltage in off state upper range <= 2.85 - 3.25 V (hardware values) 	ECT @ cylinder block > -30° C Engine stop notween	0.8 s Continuous Nagen AG. Volk	• 2 DCY (NAR)	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 . Stage .
EVAP Sys- tem Leak De- tec- tion Pump Con- trol Cir- cuit/ Open	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Open Circuit	• Output volt- age 1.85 – 2.28 V (harde ware values)	Actuator commanded off	2.0 sContinuous	• 2 DCY (NAR)	- Check the Leak Detec- tion Pump - V144 Refer to ⇒ "3.6.22 Leak Detec- tion Pump V144 , Checking", page 1143 .
EVAP Sys- tem	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Ground	r Output voit- 🤈	• Actuator commanded off manded off	• 2.0 s • Continuous	• 2 DCY (NAR)	- Check the Leak Detec- tion Pump - V144 Refer to ⇒ "3.6.22 Leak Detec- tion Pump V144, Checking", page 1143.
P2402 EVAP Sys- tem Leak De- tec- tion Pump Con- trol Circuit High	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Battery Plus	perature > 155 – 185° C Output current	Actuator com- manded on	2.0 sContinuous	• 2 DCY (NAR)	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P2407 EVAP System Leak Detection Pump Sense Circuit Intermittent/ Erratic	Emission (EVAP) System Sig- nal Check	 Pump current oscillation > 1.5 mA And Number of aborted leak measurements due to pump current oscillations > 0.0 [-] 	Time after measurement start > 4.0 s (during ECM keep alivetime)	624.0 s Once / DCY	• 2 DCY (NAR)	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.	
P240 A EVAP System Leak Detection Pump Heater Control Circuit/ Open	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Open Circuit	age lower range 1.85 – 2.28 V Output voltage upper range 2.75 – 3.36 V (hardware values)	Actuator composed in the part of the	• 0.3 s • Continuous	• 2 DCY (NAR)	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .	Brandliablis
P240 B EVAP System Leak Detection Pump Heater Control Circuit Low	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Ground	Output voltage < 1.85 – 2.28 V (hardware values)	Actuator commanded off	• 0.3 s • Continuous	• 2 DCY (NAR)	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking" page 1,143.	
C EVAP	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Battery Plus	perature > 155 – 185° C Or	Actuator com- manded on	• 0.3 s • Continuous	• 2 DCY (NAR)	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking". page 1143 .	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2414 O2 Sen- sor Ex- haust Sam- ple Er- ror Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Front Rationality Check	Pump current correction > 1.2 mA (nernst-cell)	 O2S front ready Fuel cut off not active Cylinder shut off not active Injection mode change not active Depending on engine state: Engine part load Engine full load Engine idle For time >= 3.0 s 	• 10.0 s • Continuous	• 2 DCY (NAR)	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P2431 AIR Sys- tem Air Flow/ Pres- sure Sen- sor Circuit Rang e/Per- for- manc e Bank 1	Air Injection (AIR) Pressure Sensor Rationality Check	Difference between AIR pressure and barometric pressure > 6.0 kPa Difference between AIR pressure and intake manifold pressure > 6.0 kPa	Engine stop For time not calibrated s Nolkswagen AG. Volkswagen AG. Vol	• 0.1 s • Multiple	• 2 DCY (NAR)	- Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 . Checking", page 1165 . - For Beetle, check the Secondary Air Injection Sensor 2 - G610 Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 · G610 . Refer to ⇒ "6.6.30 Secondary Air Injection Sensor 2 · G610 . Refer to ⇒ "6.6.30 Secondary Air Injection Sensor 2 · G610 . Refer to ⇒ "6.6.30 Secondary Air Injection Sensor 2 · G610 . Refer to page 1161 · Refer to · 3.6.30 · 3.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions		MIL Illumina-	Component Diagnostic Procedure
P2432 AIR Sys- tem Air Flow/ Pres- sure Sen- sor Circuit Low Bank 1	Secondary Air Injection (AIR) Pres- sure Sensor Out Of Range Low	Sensor volth Selected part or in part or in whole, is not on the part or in part or in whole, is not or in part or in p	Protected by Copyright, Cop	• 0.1 s • Continuous	• 2 DCY (NAR)	- Check the Secondary Air System - GX24- Refer to ⇒ "3.6.32 Secondary Air System GX24 Checking" page 1165 Check the Secondary Air Injection Sensor 2
P2433	Secondary	* Songer volt	adon individos vidos individos indiv	018	obe 2° DCY	G610Refer to ⇒ "3.6:30 Secondary Aic injection Sensor 2 G610
AIR System Air Flow/ Pressure Sensor Circuit High	Air Injection (AIR) Pressure Sensor Out Of Range High	age > 4.50 V	∞eło19	O.1 s Ontin- uous	(NAR)	Secondary Air System - GX24 Re- fer to ⇒ "3.6.32 Secondary Air System GX24, Checking", page 1165 .
Bank 1						- For Beetle, check the Secondary Air Injection Sensor 2 - G610 Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610, Checking", page 1161.

		alitho		1000 On			
S	DTC/ De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
or commercial purposes, in part or in whole, is not	P2440 AIR Sys- tem Switc hing Valve Stuck Open Bank 1	Secondary Air Injection (AIR) Valve Functional Check	• Ratio relative pressure phase 1 and relative pressure phase 2 > 1.30 [-]	 General: AIR pump active Catalyst heating active AIR active MAF 140.0 kg/h ECT @ cylinder block >= -10; < 115° C IAT @ manifold >= -10; < 100° C Modeled catalyst temperature < 700° C Relative baron metric pressure > 0.73 [-] Diff. BARO vs. MAP n.a. kPa Engine n.a. 	w excto the correctness of information in this coop. • • • • • • • • • • • • • • • • • • •	• 2 DCY (NAR)	- Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163 Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.
	EVAP Sys- tem	Evaporative Emission (EVAP) System Ra- tionality Check	 Time after measurement start > 2.0; < 2.5 s And Drop of evap pump current < 3.0 mA 	 Barometric pressure > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) Airbag not activated 	• 0.5 s • Once / DCY	• 2 DCY (NAR)	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .

DTC / Monitor	Molfunction Ori	Socondon/ Parama	Monitorin -	MII Illureine	Component D:
DTC / Monitor De- Strategy scrip- Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2563 Turbo- Tur- bo- charger er Boost Con- trol Position Sen- sor "A" Circuit Rang e/Per- for- manc e	2.73 V	Gradient of boost pressure >= -2.98%/s	0.3 s Continuous	• 2 DCY (NAR)	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
P2564 Turbo- charger (TC) Posi- tion Sensor Short To Ground / Open Cir- cuit Posi- tion Sen- sor "A" Circuit Low	Turbocharger boost control position sen- sor voltage < 0.20 V		0.5 s Continuous	• 2 DCY (NAR)	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .
P2565 Turbo- charger bo- charger (TC) Posi- tion Sensor Short To Battery Plus Control Posi- tion Sen- sor "A" Circuit High	Turbocharger boost control position sen- sor voltage > 4.80 V	at orin whole, is not soming the state of th	• 0.5 s • Contin-	_r åger2∆ĐĆʻYlkswa (NAR)	Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113
		torin whole, is not be the purposes, in part or in whole, is not be the purposes, in part or in whole, is not be the purposes.			to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
ECM/ PCM En- gine Off Timer Per- for- manc e	Engine Off Time Ra- tionality Check	Difference be- tween engine- off time and ECM keep alive-time > 12.0 s	 Monitor Entry Conditions: ECM keep alive time active Delay time >= 1.0 s Last ECM activation time >= 2.0 s Time after last engine stop < 48 h Case 1: For time (after entry conditions fulfilled) >= 65.0 s Case 2: For time (after entry conditions fulfilled) <= 65.0 s 	 10.0 ms Once / DCY 	• 2 DCY (NAR)	- Check power and ground inputs to ECM first. Refer to appropriate wiring schematic for pin locations. If all powers/ grounds to ECM are present, replace the Engine Control Module - J623 Refer to appropriate repair manual.
Ses, III	d dundo in interest of the int	Difference between engine-off time and ECM keep alive-time >= 12.0 s 19papagalay	 Ignition key fransition off to on Time after engine stop < 86,400.0 s Engine off time plausible Engine off time monitoring not finished Engine off time signal valid Time after reset < 2.0 s Case 1: Engine off timer not calibrated Engine off timer not calibrated s Case 2: ECM internal timer active SPI communication failure after reset detected 	• Once / DCV	ect to the correctness of in	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Check	• ECM internal timer failure ECM internal timer signal not calibrated • ECM internal timer not calibrated • time after last engine stop not calibrated h	SPI initialisation finished	• 1.3 s • Continuous		itid with respect to the correctness of information
P3043 Fuel Pump Me- chani- cal Mal- func- tion	COM: Fuel Pump Con- trol Module (FPCM) Communi- cation With FPCM	• FP signal: ROM / RAM failure feed- back >= 3.0 [-]	• Engine on	• 13.8 s • Continuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 .
Fuel Pump "A" Con- trol	COM: Fuel Pump Con- trol Module (FPCM) Communi- cation With FPCM	FP signal: overcurrent failure feed- back >= 3.0 [-]	Engine on	16.8 sContinuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 .
Fuel	COM: Fuel Pump Con- trol Module (FPCM) Communi- cation With FPCM	FP signal: ro- tary failure feedback >= 3.00 [-]	Engine on	19.8 sContinuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P3073 Fuel Pump "A" Con- trol Cir- cuit/ Open	Pump Con-	FP signal: power amplifi- er failure feed- back >= 3.00 [-]	Engine on	22.8 sContinuous	• 2 DCY (NAR)	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 .
P334 A Actua- tor Elec- trical Error	Turbo- charger (TC) Boost Pressure Control Short Cir- cuit	Bypass valve driver current driver stage internal value (hardware val- ues)	Boost pressure control active	0.4 sContinuous	• 2 DCY (NAR)	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113
	Not borning	Sunessauthorised by Volker	_{vagen} AG. Volkswagen AG o	oes not guarants	oracced tan liability with	- Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 , Checking", page 1172 .
CAN Com- muni- cation Bus	CAN: Pow- ertrain BUS Reading Back Sent Message Powertrain	Message no feedback	Time after ignition on 0.5 s	0.5 sContinuous	• 2 DCY (NAR)	terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
U000 2 High Speed CAN Com- muni- cation Bus Per- for- manc e		• Global time- out >= 0.4 s	• Time after ignition on >= 0.5 s	• 0.5 s • Continuous	• 2 DCY (NAR) (NAR) (NAR)	- Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.

DTC/	Monitor	Malfunction Cri-	Secondary Parame-	Monitorina	MIL Illumina-	Component Di-
De- scrip- tion	Strategy Description	teria and Thresh- old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure
Com- muni-	COM: Transmis- sion Control Module (TCM) Communi- cation With TCM	Received message from TCM no message sage	Time after ignition on 0.5 s	1.0 sContinuous	• 2 DCY (NAR)	- Check the CAN-Bus terminal resistance between the Transmission Control Module and the Engine Control Module - J623 - Refer to 3.6.6 CAN-Bus Terminal Resistance, Powertrain, Checking, page 1112 .
	COM: Brake Sys- tem Control Module (BSCM) Communi- cation With BSCM	Received CAN mes- sage no mes- sage The sage authorized by The sage aut	Time after ignition on >= 0.5 s Time after ignition of the ignition of t	 0.5 s Continuous 	• 2 DCY (NAR)	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109.
Com- muni-	COM: Body Control Module (BCM) Communi- cation With BCM		Time after ignition on 0.5 s	2.0 sContinuous	• 2 DCY (NAR)	- Check the CAN-Bus terminal resistance. Resistance. Checking", page 1109
U014 6 Lost Com- muni- cation With Gate- way "A"	COM: Gate- way Com- munication With Gate-	Received CAN message no message An message no message no message An message no message	• Time after ignition on >= 0.5 s	• 0.5 s • Continuous	• 2 DCY (NAR)	- Check the EAN-Bus Terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
		30	Protected by	DA nagenzylov.		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U015 5 Lost Communication With Instrument Panel Cluster (IPC) Control Module	COM: In- strument Panel Clus- ter IPC Communi- cation With IPC	sage sage satthorn said or in whole, is hold of the sage of the sa	adby well off 2 = 0.0 3	• Continuous	or other or acce	Bus Terminal Resistance, Checking", page 1109
U030 2 Soft- ware In- com- pati- bility With Trans- mis- sion Con- trol Mod- ule	Engine Control Module (ECM): Coding Code Check Of ECM Concerning TCM	Received AT vehicle data TCM signal • Ambient temperature sensor: Source	Protected by Copy	• 50.0 s • Continuous	• 2 DCY (NAR)	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module. Refer to appropriate repair manual.
U032 3 Soft- ware In- com- pati- bility With Instru- ment Panel Con- trol Mod- ule	COM: Ambient Air Temperature (AAT) Sensor Communication With	Ambient temperature sensor: Source configuration failure	Time after ignition on > 1.2 s	• 1.0 s • Continuous	• 2 DCY (NAR)	 Check for correct soft- ware version and VIN or update soft- ware for the IPC Module if available. If OK, replace the Instru- ment Cluster Control Mod- ule - J285 Refer to ap- propriate re- pair manual.
U040 2 Invalid Data Re- ceived From TCM	COM: Transmis- sion Control Module (TCM) Communi- cation With TCM	Received data from TCM im- plausible message	Time after ignition on 0.5 s	• 0.3 s • Continuous	• 2 DCY (NAR)	 Check for software up- dates and TSB's. Re- program as necessary. If none are found, re- place the Transmis- sion Control Module . Re- fer to appro- priate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
Data Re-	COM: Vehi- cle Speed Sensor (VSS) Com- munication	Speed sensor signal: sensor error 327.42 km/h	Time after igni- tion on > 500.0 ms	• 0.5 s • Continuous	• 2 DCY (NAR)	 Check the CAN-Bus terminal re- sistance. Re- fer to 	
ceived From Anti- Lock Brake	With VSS	Speed sensor signal: initiali- sation error 327.08 km/h				⇒ "3.6.5 CAN- Bus Terminal Resistance, Checking",	
Sys- tem (ABS) Con- trol		Speed sensor signal: low voltage error 327.25 km/h				<u>page 1109</u> .	
Mod- ule		Speed sensor signal: range error 326.40 – 327.07 km/h					
		Speed sensor signal: range error 327.09 – 327.24 km/h	.%	orised by Volksw	agen AG. Volkswa	gen AG does not guarar	**************************************
		Speed sensor signal: range error 327.26 – 327.41 km/h	it dilless du				O'RCORPIRADILIANI
		Speed sensor signal: range error 327.43 – 327.67 km/h	n whole, is not,				to with respect
	COM: Brake System Control Module (BSCM) Communication With BSCM	Received data from TCS im- plausible message	Time after ignition on >= 0.5 s Time after ignition on >= 0.5 s				to the correctness of infon
	Vehicle Speed Sen- sor (VSS) Rationality Check High	• Vehicle speed > 325 km/h	muo boatenidi	2.0 sContinuous			nation in this clock
3 Invalid Data Re- ceived From	COM: In- strument Panel Clus- ter IPC Communi- cation With IPC	Received data from IPC im- plausible message	Time after ignition on >= 0.5 %	• 0.5 s Contin-	• 2 DCY (NAR)	IPC Module if	
Instru- ment Panel Clus- ter Con- trol Mod- ule	COM: Ambient Air Temperature (AAT) Sensor Communication With AAT Sensor	Ambient air temperature signal failure	Time after ignition on > 0.5 s	0.6 s Continuous		available. If OK, replace the Instrument Cluster Control Module - J285 Refer to appropriate repair manual.	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure
	COM: Ambient Air Temperature (AAT) Sensor Communication With IPC	Ambient temperature sensor: source in reset failure	Time after igniagent tion on A 1.2 s Engine running	• Continuous	n AG does not gual	agnostic Procedure
U044 7 Invalid Data Re- ceived From Gate- way "A"	COM: Gate- way Com- munication With Gate- way	Received data from gateway implausible message	Time after ignition on >= 0.5 s	• 0.5 s • Continuous	• 2 DCY (NAR)	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance. Checking, page 1109
U110 3 Pro- duc- tion Mode Active	Control Module (ECM): Pro- duction Mode Func-	Production mode active	 Vehicle speed < 5 km/h Max trip mileage since initial vehicle start-up < 100 km During ECM keep alive-time after ignition off Engine speed 0 RPM For hybrid: Drive motor off 	• Continuous	OA negeweylov (WAK)	- Vehicle is in production mode. Refer to appropriate repair manual for resolution. Note the mode can be deactivated with a factory scan tool or will automatically turn off after vehicle accumulates the first 100 km (62.14 miles) of driving.

Engine Control Module , 2017 MY

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P000 A "A" Cam-	Variable Valve Tim- ing (VVT) Intake Ac-	 Adjustment angle differ- ence >= 3.0; < 15.0° CRK 	Modeled oil tem- perature -40 – 160° C	• 0 (FTP75: 300.0) s	• 2 DCY	Check the Camshaft Adjustment Valve 1 -
shaft Posi-	tuator slow response		• Engine speed 608 – 6,016 RPM	Continuous		N205 Referto
Slow Re-			• Set point change > 29.0° CRK			Camshaft Adjustment Valve 1
e Bank			tion not calibrated			N205, Checking",
'			sis timer >= 0.95 - 4.0 s			page 1105 . - Check the
		isedby Voll	_{Swagen} AG. Volkswagen A(a does not guara		Camshaft Position Sensor - G40 Refer
	2005 2005	in dinies autron	Set point change > 29.0° CRK Camshaft position not calibrated Dynamic diagnosis timer >= 0.95 - 4.0 s AG. Volkswagen AG. V		Recoraccepted libelling	to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107
	, in part or in whole,					Check the Fuel Pres- sure Regu- hating Valve - N276 Refer
	commercial purposes				, don-	the Negutating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
	000	STUDIO TUR			Microsoft in the Control of the Cont	- Check the Engine Speed Sen- sor - G28 Refer to ⇒ "3.6.11
		VIIAdoo Aq B	Protecte	⁹ Beweylo Vajn		Engine Speed Sensor G28, Checking", page 1121.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0010 "A" Cam- shaft Posi- tion Actua- tor Con- trol Cir- cuit/ Open Bank 1	Valve Tim- ing (VVT) Intake Ac- tuator Open	Output voltage lower range 1.92 – 2.21 V Output voltage upper range 2.85 – 3.25 V	• Actuator commanded off	• 2.0 s • Continuous	• 2 DCY	Check the Engine Speed Sensor - G28 Refer to "3.6.11 Engine Speed Sensor G28, Checking", page 1121. Check the Camshaft Position Sensor - G40 Refer to "3.6.4 Camshaft Position Sensor G40, Checking", page 1107. Check the Camshaft Adjustment Valve 1 - N205 Refer to "3.6.3 Camshaft Adjustment Valve 1 N205 Checking", page 1105. Checking", page 1105.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
shaft Position - Tim- ing Over- Ad- vance d or Sys- tem Per- for- manc e Bank 1	(London Market)	umorsed by Volkswagen A	 Modeled oil temperature -40 – 160° C Engine speed 608 – 6,016 RPM Camshaft position n.a. Camshaft position adjustment active Catalyst heating not active Camshaft position deviation integrator (actual vs. set point position) >= 9.0 – 12.0° CRK*s 	O (FTP75: 250.0) s Continuous Guarantee Oracogy Guarantee Oracogy	$_{\rm tand}$ liability with respect to the correctness of i_{n} for i_{n} to i_{n}	 Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121. Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107. Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 Checking", page 1105.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Crank shaft	Position (CMP/CKP) Intake Sen- sor Adapta- tion Value Monitoring	Adapted value for each edge of the target wheel < -14.0° CRK Adapted value for each edge of the target wheel > 14.0° CRK Adapted value for each edge of the target wheel > 14.0° CRK	tion adaptationswa (exhaust side) active • Engine speed 288 – 4,000 RPM • Modeled oil temperature >= -15° C • Modeled oil temperature <= 160° C • Diff. actual exhaust camshaft position vs. previous camshaft position @ reference signal edge		*SUATANTER OF ACTE BY	Checking", page 1121. - Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107. - Check the Camshaft Adjustment

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0030 H02S Heat- er Con- trol Circuit Bank 1 Sen- sor 1	(O2S) Heat- er Front Open Cir- cuit	 O2S front heater voltage lower range 1.92 – 2.21 V O2S front heater voltage upper range 2.85 – 3.25 V 		2.5 sContinuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P0031 H02S Heat- er Con- trol Circuit Low Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Heat- er Front Short To Ground	O2S front heater voltage < 1.92 – 2.21 V O36 front heater voltage V O46 front heater voltage V O47 front heater voltage V O47 front heater voltage V O48 front heater voltag	• Modeled EGT @	• 2.5 s agen AG. Volks Contin- uous	• 2 DCY wagen AG does no	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152
P0032 H02S Heat- er Con- trol Circuit High Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Heat- er Front Short To Battery Plus	heater driver temperature > 160.0 – 200.0° C Or O2S front heater driver output current > 8.0 – 12.0 A	O2S front >= -273° C • Actuator commanded on	• 2.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P0033 Tur- bo- charg- er/Su- per- charg- er By- pass Valve "A" Con- trol Circuit	Turbo- charger By- pass (TCBY) Open Cir- cuit	Voltage lower range 1.92 – 2.21 V Voltage upper range 2.85 – 3.25 V (hardware values)	 Actuator commanded off of the second commanded off of the second command command	• 1.0 s • Contin-	• SAnsgsweyr	- Check the Turbocharg- er Recircula- tion Valve - N249 Refer to ⇒ "3.6.35 Turbocharg- er Recircula- tion Valve N249 Checking", page 1172.
Silouit						- Check the Actuator - V465 Refer to ⇒ "3.6.7

DTC De- scrip tion	Strategy - Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Turbo- charger By- pass (TCBY) Short To Battery Plus	• Temperature > 160 – 200° C	Actuator commanded on			Charge Air Pressure Ac- tuator V465, Checking", page 1113
Tur- bo-	pass	(hardware val-	manded off	1.0 s Continuous .	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 - Checking", page 1172 . - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .
P003 HO2 Hear er Con trol Circu Ban 1 Ser sor 2	Oxygen Sensors (O2S) Heater Rear Open Circuit	O2S rear heater voltage lower range 1.92 – 2.21 V O2S rear heater voltage upper range 2.85 – 3.25 V	Engine not in start process • Engine No. Mallington in Start process • Engine not in Start process	• 2 s • Continuous of information in this	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0037 HO2S Heat- er Con- trol Circuit Low Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Heat- er Rear Short To Ground	O2S rear heater voltage < 1.92 – 2.21 V	Engine Not in start process Output Description: Output De	2.5 sContinuous	• 2 DCY	Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
	Oxygen Sensors (O2S) Heat- er Rear Short To Battery Plus	 O2S rear heate driver temperature > 160.0 = 200.0° C O2S rear heater driver output current > 8.0 - 12.0 A 	Modeled EGT @ O2S rear >= 300° C Actuator commanded on Engine not in start process Deviation between actual and	• 2.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
Tur- bo- charg-	Turbo- charger (TC) Boost Pressure Control Open Cir- cuit	Bypass valve driver load resistance > 200 kΩ	 Deviation between actual and filtered boost pressure actuator position <= 5.0% Boost pressure control not active Time delay > 1.0 s 	• 0.4 s • Continuous	⊕∀ ^v 2 DCY	- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 Checking", page 1172 . - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Tur- bo- charg-		 1.8L Turbocharger speed >= 240,002 RPM 2.0L Turbocharger speed >= 213,000 RPM IAT @ throttle >= 336° C 1.8L For time >= 6.0 s x x x x x x x x x x x x x x x x x x	Engine running Magen AG. Volkswagen AG.	• 2.6 s • Continuous	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249- Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 Checking", page 1172 .
	hole, is not bearing.	>= 6.0 s 2.0L For time >= 25.5 s	wagen AG. Volkswagen AG.	.iot guarant	Reo's RC ROTATIVITY MITH 169	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
MAP/ MAF - Throt- tle Po-	Manitold	Diji. MAF SEL	 Fast throttle adaptation finished MAP gradient -200.00 - 200.00 kPa/s Vehicle speed <= 2 km/h Time after engine start > 5.0 s Engine speed lower range > 576 RPM Engine speed upper range < 3.000 RPM ECT @ manifold > -48° C Pressure quotient @ throttle 0.10 - 	5.0 5	2 001	E CHECK HE
		Ord Billidos Meilldos Kabe	RPM • Engine speed upper range < 3,000 RPM • IAT @ manifold > -48° C • ECT @ cylinder block > -48° C	DEWRYNOW KAMER	KOO TABILITO	take Mani- fold Sensor - GX9 Refer to ⇒ "3.6.20 In- take Mani- fold Sensor GX9 , Check- ing", page 1139 .
			 Pressure quotient (a) throttle 0.10 – 0.60 [-] Load dynamic conditions: Dynamic engine speed < 8,160 RPM Dynamic air mass < 25.01 mg/ stk 			- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0070 Ambi- ent Air Tem- pera-	bient Air Tempera- ture (AAT) Sensor	• AAT sensor	modeled adaptation active (by throttle opening area) Throttle position 0.000 – 100.003° TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] Fast throttle adaptation finished MAP gradient -200.0 – 200.0 kPa/s Fuel cut off not active Time after engine start > 5.0 s	• 2.0 s • Continuous	• 2 DCY	Temperature
ture Sen- sor	Short To Battery / Open Cir-	State to Tall do state of the s	(D)C	Makewage Way		to **3.6.24 Outside Air Temperature Sensor G17 Checking", page 1148 Check the CAN-Rus

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Ambi- ent Air t Tem- pera-	rommercial purposes, in part or in whole, is not been	 High side: reference measuring Diff. AAT @ cold start vs. IAT @ manifold @ cold start vs. ECT @ cylinder block @ cold start not calibrated [K] Diff. AAT @ cold start vs. ECT @ radiator outlet @ cold start vs. ECT @ radiator outlet @ cold start > 20.0 K Min. amount of faulty reference measurements to detect defective sensor 2.00 [-] OR Low side: reference measuring Diff. IAT @ cold start vs. AAT @ cold sta	>= 360.00 [min] • Engine off time plausible • Time after engine start < 6553.5 s • Depending on temperature slope @ cold start: • Diff. actual IAT @ manifold vs. IATA @ manifold vs. IATA @ manifold ws. IATA @ manifold ws. IATA @ manifold ws. IATA @ manifold ws. IATA @ start of DCY < 256.0 K • Diff. actual ECT @ cylinder block ws. ECT @ cylinder block ws. ECT @ cylinder block ws. ECT @ radiator outlet @ start of DCY < 256.0 K • Diff. actual AAT ws. AAT @ start of DCY < 256.0 K • For time >= 0.1 s • Depending on		• 2 DCY	pect to the correctness of <i>inform</i>

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Diff. actual ECT @ cylinder block vs. min. ECT @ cylinder block not calibrated [K]			
			 Diff. actual AAT vs. min. AAT < 4.5 K 			
			Diff. actual ECT @ radiator outlet vs. min. ECT @ radiator outlet < 4.5 K			
P0072 Ambi- ent Air Tem- pera- ture Sen- sor Circuit "A" Low	COM: Ambient Air Temperature (AAT) Sensor Short To Ground	AAT sensor voltage < 0.10 V (hardware values) AAT sensor voltage < 0.10 V (hardware values)	4.5 K	Continuous gen AG does no	• 2 DCY	- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17 . Checking". page 1148 Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking". page 1109 .
	7	The common to alevirth of Grindo of Meire	Protected by co.	JN nagen AG.	Manajindoo jilaani	page 1109.

	Generic Scan 1001 - Edition 12.2017							
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illur Time Length				
	Fuel Rail Pressure (FRP) Out Of Range Low	 Deviation between reference fuel pressure set point and current fuel pressure > 2,000.10 kPa Case 1: Deviation lambda of controller included adaptation -50.0 - 50.0% High pressure 	 General: Engine speed > 608 - 6,816 RPM Fuel mass set point 15.01 - 1,389.0 mg/stk Time after engine start > 5.0 s Engine warm-up not calibrated Catalyst heating not active Full load not calibrated 	Continuous Continuous	fuel pressure and delivery quantity. Re- fer to fuel			
MOO YO DONE	TO TO BURDO WEWA	 Figil pressure controller output > 30 mg Fuel pressure < 2,500.0 kPa Case 2: Fuel pump at max limit Mass fuel flow set point not calibrated mg/stk Fuel pressure not calibrated kPa 	 Catalyst purge not calibrated Lambda control not calibrated Evap purge functionality diagnosis not calibrated Depending on low dynamic conditions: Fuel mass set point lower range > 1.99 mg/stk For time >= 5.0 s 	OO THE COOL	lating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pres-			
	Fuel Rail Pressure (FRP) Ra- tionality Check Low	 Deviation lambda of controller included adaptation -50.0 – 50.0% High pressure controller output > 35 mg Deviation between fuel pressure set point and current fuel pressure > 2,000.10 kPa Fuel pressure < 2,500.0 kPa 	 Fuel mass set point upper range < 100.32 – 172.41 mg/stk Fuel mass set point gradient -1,389.0 – 2.20 mg/stk For time >= 1.2 s Depending on canister purge: Canister load not calibrated [-] Evap purge valve not calibrated 	• 5.0 s • Continuous	sure Regulator Valve N276. Checking", page 1129. Check the Fuel Delivery Unit - GX1-/ Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538. Testing", page 1125.			

	Malfunction Cri- eria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P0088 Fuel Rail/ System Pressure - Too High Bank 1	High pressure controller output < -30 mg Case 2:	point 15.01 – 1,389.0 mg/stk Time after engine start > 5.0 s Engine warm-up not calibrated Catalyst heating not active Full load not calibrated Catalyst purge not calibrated Lambda control not calibrated Evap purge functionality diagnosis not calibrated Duel pressure setpoint gradient <= 200.06 [kPa] And Depending on low dynamic conditions:	3746	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1° Preliminary Check", page 13 and/ or to appropriate repair manual. - Check the Fuel Pressure Sensor G247 · Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 · Checking", page 1131 · - Check the Fuel Pressure Regulating Valve - N276 · Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve - N276 · Checking" · page 1129 · Checking · Checking · page 1129 · Checking · Checking · page 1129 · Checking · pag	The ed acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in this odd acceptant liability with respect to the correctness of information in the correctness of the correctnes

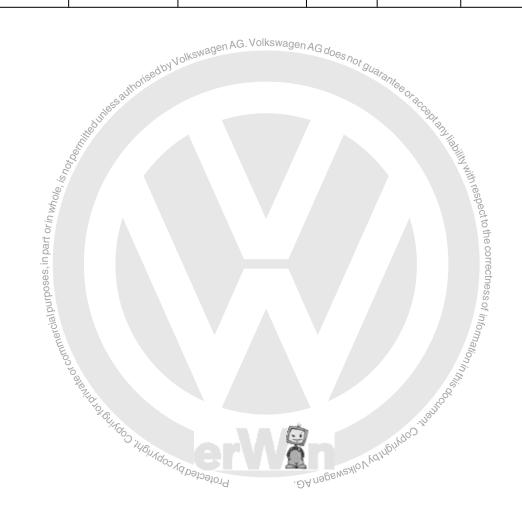
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0090 Fuel Pres- sure Regu- lator 1 Con- trol Cir- cuit/ Open	Fuel Volume Regulator Control Open Circuit	 Voltage high side < 1.87 – 2.26 V Voltage low side > 2.78 – 3.33 V Low and high side off: Voltage low side ≥ 2.78 – 3.33 V Voltage high side < 1.87 – 2.26 V Low and high side on: Current low side < 12.2 – 15.0 A Current high side < 13.5 – 16.5 A 	 Engine speed 0 RPM Fuel cut off active Actuator commanded off Engine speed > 600 RPM Fuel cut off not active Actuator commanded on 	• 0.2 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 . Check the Fuel Pressure Regulator Valve - N276 Refer to 53.6.15 Fuel Pressure Regulator Valve N276 . Checking", page 1129 .
P0091 Fuel Pressure Regulator 1 Control Circuit Low	Fuel Vol- ume Regu- lator Con- trol Short To Ground (High Side) Fuel Vol- ume Regu- lator Con- trol Short To Ground (Low Side)	Current high side > 13.5 – 17.0 A Voltage low side < 1.87 – 2.26 V (hardware values)	 Ignition on Ignition off (during ECM keep alive-time) Actuator commanded on Ignition on Ignition off (during ECM keep alive-time) Actuator commanded off 	• 0.2 s • Continuous	Mghqoo jaamoo	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 . - Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129 .

Pool	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Fuel Control Valve Short To Battery Plus (High Side) - Voltage high side < 2.78 – 3.33 V (hardware values) - Unit GX1 / Fuel Pump Control Module J538 Testing. - Actuator commended off	Fuel Pres- sure Regu- lator 1 Con- trol	trol Valve Short To Battery Plus (Low Side)	side > 13.5 –	Ignition off (dur- ing ECM keeps alive-time) Actuator com-	Contin-	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13
		trol Valve Short To Battery Plus	side < 2.78 – 3.33 V (hard-	Ignition off (during ECM keep alive-time) Actuator com-			Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125
	F Tur- bo- charg-	Turbo- charger (TC) Boost Pressure Control Functional	Boost pressure actuator position controller output > 98.0%	 Time after engine start >= 4.0 s ECT > -40° C AAT > -40° C 	O:4 s Continuous	• 2 DCY	Actuator -
F charger sure actuator position controller output > Pressure Control 98.0% start >= 4.0 s	er/Su- Fui per- Ch charg- Tra er Ch Boost Con-	Check - Transient Check	Boost pres- sure actuator position con- troller output < -98.0%	 Catalyst heating not active Boost pressure control active 			Pressure Actuator V465, Checking", page 1113.
F Tur-bo-charger (TC) Boost Pressure Control Functional Check - Transient Control Control Check Of Check Of Control Check Of Check Of Control Check Of Control Check Of Check	"A" Mod- ule Per- for- manc e	Turbo- charger (TC) Boost Pressure Control Functional Check	Deviation boost pres- sure actuator position con- troller > 12.0 – 100.0%	 Time after engine start >= 4.0 s ECT > -40° C AAT > -40° C Boost pressure control active 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	sor Engine Standing: Cross Check	ogine Diff BARO mean value vs. MAP mean value n.a. kPa Diff. deviation BARO mean value to mean value (MAP mean value, BARO mean value, BARO @ ECM keep alive time and MAP @ ECM keep alive time) n.a. kPa Diff. deviation MAP mean value (MAP mean value, BARO mean value, BARO @ FCM keep			Suaranteeoraceoraceoran	Check the Intake Manifold Sensor - GX9 Refer to 3.6.20 Intake Manifold Sensor GX9 , Checking page 1139 .

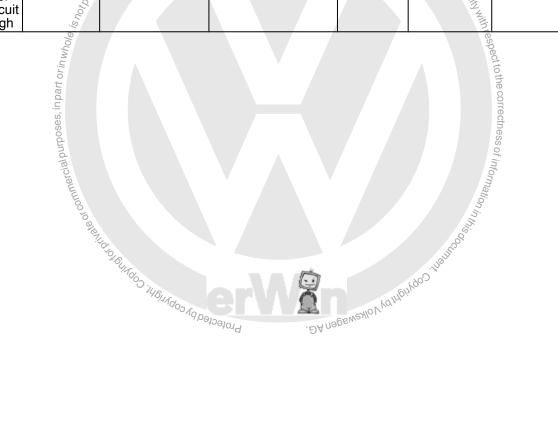
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Diff. BARO mean value vs. MAP mean value n.a. kPa				
	Manifold Absolute Pressure (MAP) Sen- sor ECM Keep Alive- Time: Cross Check	 Case 1: Charged engine Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure <= 7.50 kPa Diff. turbocharger boost pressure vs. MAP > 7.50 kPa Case 2: Non charged engine Diff. BARO mean value @ ECM keep alive vs. MAP mean value @ ECM keep alive time > 	 Engine stopped Vehicle speed < 1 km/h ECM keep alive time 10.0 – 6,553.5 s Time after engine stop >= 5.0 s BARO sensor voltage 0.20 – 4.80 V MAP sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V Most pressure sensor voltage 0.20 – 4.80 V 	ān _{tee}		
ommercial purposes, in part or in whole, is a	Intake Air (IA) System	Throttle opening area correction included controller and adaptation > 40.0% Lambda correction included controller and adaptation < -28.0%	Intake manifold modeled adaptation active (by throttle opening area) Throttle position 0.000 – 100.003° TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] Fast throttle adaptation finished MAP gradient –200.0 –200.0 kPa/s Fuel cut off not active	• 50°%	n_{ab} with respect to the correctness of $information$ in t_{bis}	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Throttle opening area correction included controller and adaptation < 40.0% Lambda correction included controller and adaptation > 28.0%	 Time after engine start > 5.0 s Turbocharger boost pressure < 135.0 kPa BARO 73.0 – 107.50 kPa 			



DTC / Monitor Strates	y teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P0107 Manifold Absolute Pressure/ Baro- metric Pressor Circuit Low Manifold Absolute Pressure (MAP) Sor Shor Ground	sensor volt- en- age < 0.20 V	Copyright of the state of the s	• 0.5 s • Continuous	• 2 DCY AG. Volkswagen	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 . Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31 Checking", page 1115 . Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 . Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 . Checking", page 1139 . Check the EVAP Canister Purge Regulator Valve 1 . Sand Page Regulator Valve	f information in this occurrence.

DTC / Monitor Strategy scrip- tion Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0108 Manifold Manifold Pressure Sensor Short To Battery Plus Barometric Pressure Sensor Circuit High	Intake manifold pressure sensor voltage > 4.80 V age > 4.80 V aduntase authorised by Volks aduntase authorised by Volk	_{wagen} AG. Volkswagen AG	O.5 s Continuous does not guaranta does not guaranta	• 2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
Intake T Air to Tem- S pera- C	ntake Air Fempera- ure (IAT) Sensor Cross Check	 High side: reference measuring Diff. IAT @ manifold @ cold start vs. AAT @ cold start vs. ECT @ cylinder block @ cold start not calibrated [K] Diff. IAT @ manifold @ cold start vs. ECT @ radiator outlet @ cold start vs. ECT @ radiator outlet @ cold start vs. IAT @ manifold @ cold start vs.	 = 360.00 [min] Engine off time plausible Time after engine start < 6553.5 s Depending on temperature slope @ cold start: Diff. actual IAT @ manifold vs. IAT @ manifold @ start of DCY < 256.0 K Diff. actual ECT @ cylinder block vs. ECT @ cylinder block ws. ECT @ cylinder block vs. ECT @ radiator outlet vs. ECT @ radiator outlet vs. ECT @ radiator outlet ws. ECT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Depending on mean value condition Mean value of all temperature sen- 	iora	7	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. - Check the Charge Air Pressure Sensor G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31. Checking", page 1115.	ith respect to the compouness of information

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Min. amount of faulty reference measurements to detect defective sensor 2.00 [-]	Secondary Parameters with Enable Conditions • Diff. actual ECT @ cylinder block vs. min. ECT @ cylinder block not calibrated [K] • Diff. actual AAT vs. min. AAT < 4.5 K • Diff. actual ECT @ radiator outlet vs. min. ECT @ radiator outlet < 4.5 K	ragen AG does i	ot guarantee or accept	Mapilly Milling Markespection
	Intake Air Tempera- ture (IAT) Sensor Short To Ground	IAT sensor voltage < 0.10 V	Protected by Copy	• Continuous	2301	- Check the Intake Manifold Sensor - GX9 Refer to \$\infty\$ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 . Check the Charge Air Pressure Sensor - G31 Refer to \$\infty\$ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .
	Intake Air Tempera- ture (IAT) Sensor Open Cir- cuit	IAT sensor voltage > 4.50 V		 2.0 s Continuous 	• 2 DCY	 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0116 En- gine	Engine Coolant Tempera- ture (ECT) Sensor No Change On Signal	Difference be- tween maxi- mum and min- imum temper- ature of ECT @ cylinder block < 2° C	block > -256° C IAT @ throttle -48 - 143° C depending on thermostat control: ECT @ cylinder block <= 82° C or ECT @ cylinder block >= 98° C Engine running And Engine part load Or Engine full load Engine speed >			- Check the Engine Coolant Temperature Sensor G62 - Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117 . - Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 - Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119 .
	Coolant Tempera	Difference between modelled and measured extinder.	 Vehicle speed >= 50 km/h Engine load > 6.00 % For time >= 30.0 = 60.0 s Engine idle Vehicle speed < 255 km/h Or Fuel cut off active Or Engine stop for time >= 30.0 - 60.0 s Time after engine start > 100.0 s ECT @ cylinder block -128 - 127° C Time after engine start > 60.0 s 	• 10.0 s • Continuous	The of acceptant liability	why with respect to the correctness of inform.
	ture (ECT) Sensor @ Cylinder Block Ra- tionality Check Low	ured cylinder block temper- ature > 10° C	• Time after engine start > 60.0 s	A Volkewagen A	Mentoo inantoo	¹⁶ 07 in

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<u>ک</u> ر	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
in part or in whole, is not be seen to see of commercial purposes, in part or in whole, is not be smith.		Engine Coolant Tempera- ture (ECT) Sensor @ Cylinder Block Ra- tionality Check Inap- propriately Low	Diff. min temperature of cross check sensors vs. ECT @ cylinder block @ engine start >= 10° C	Cross checks fin- ished	1.0 s Once / Once / DCY		
arivate or commercial purpo	To Rundoo,	Engine Coolant Tempera- ture (ECT) Sensor @ Cylinder Block Ra- tionality Check High	• ECT @ cylinder block @ engine start > 40 – 80° C	 Cross checks finished Engine running Engine off time >= 240.00 min Valid AAT signal for time >= 2.0 s 	• 10 s • Once / DCY		
		Engine		Valid engine stop signal for time >= 3.0 s			
	En- gine	Engine Coolant Tempera- ture (ECT) Sensor Short To Ground	Very ECT sensory very voltage < 0.30 V	DEW.	• 0.5 s • Continuous	• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor - G62 Refer to ⇒ "3.6.9 En- gine Coolant Temperature Sensor G62, Checking". page 1117.
							 Check the Engine Cool- ant Temper- ature Sensor on Radiator Outlet - G83 Refer to
							⇒ "3.6.10 Engine Cool- ant Temper- ature Sensor On Radiator Outlet G83, Checking", page 1119.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0118 Engine Coolant Temperature Sensor 1 Circuit High	Engine Coolant Tempera- ture (ECT) Sensor Short To Battery / Open Cir- cuit	ECT sensor voltage > 4.90 V	 IAT at throttle >= -33° C Time after engine start > 60.0 s 	0.5 s Continuous .Volkswagen A	• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor - G62 Refer to ⇒ "3.6.9 En- gine Coolant Temperature Sensor G62, Checking", page 1117.
		, in part orin whole, is not bennited the second of the se	• Throttle adapta-	. Total age in A	G does not guarante	Checking", page 1117 - Check the Engine Coolant Temper- ature Sensor Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temper- ature Sensor On Radiator Outlet G83 Checking", page 1119
P0121 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "A" Circuit Rang e/Per- for- manc e	sition Sen- sor (TPS) 1	difference be- tween meas- ured and modeled val- ue of mass air flow from TPS 1 >= 1.0 [-]	• Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) not active	• Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169
P0122 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "A" Circuit Low	sition Sen- sor (TPS) 1	Throttle position sensor 1 voltage < 0.17 V		O.2 s Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0123 Throttle/ Pedal Position Sensor/ Switc h "A" Circuit High	Throttle Position Sensor (TPS) 1 Short To Battery Plus	Throttle position sensor 1 voltage > 4.83 V		• 0.2 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169 .
P0131 O2 Sen- sor Circuit Low Volt- age Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Front Short To Ground	• O2S sensor voltage < 0.15 V	• Engine running	• 0.5 s • Continuous		- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P0132 O201- Sector Circuit High Volt- age Bank 1 Sector Sec	Sensors (O2S) Front Short To Battery Plus	• O2S sensor voltage > 5.20 – 5.35 V	Engine running	• 0.5 s • Continuous	DCY Although the correctness of information in the correctness of the	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
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DTC / Monitor De- scrip- tion Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0133 Oxygen Sensors (O2S) From Sensors (O2S) From Dynamic Path Response Check Sensors 1	 Mean value of normalised signal amplitude >= 1.0 [-] Ratio check Ratio of failed diagnostic cycle not calibrated [-] 	General conditions: Time after engine start not calibrated s ECT >= -48° C	»DA riaga		Catalytic Converter GX10 . Checking", page 1152 . Checking the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of information in this could be converted to the correctness of the correctness of information in this could be converted to the correctness of the correctness

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Dynamic MAF not calibrated mg/stk			
			Dynamic MAF per segment < 30.0 kg/h			
			Dynamic lambda not calibrated %			
			• Change of dy- namic torque < 0.07 [-]			
			Conditions range 2: (Diagnosis car- ried out together with the catalyst efficiency diagno- sis)			
			General conditions			
			• Vehicle speed >= 10 km/h			
		gen AG. Volkswagen A	BARO not cali- brated kPa			
asi a	norised by Volkswa	igo.	Catalyst over- heating protec- tion not active			
id dilless			Turbine over- heating protection not active	liac		
shotoe			O2S rear ready	MittyWith		
0/0/10/6			O2S heater rear active	respec		
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	O2S front ready	ttothe		
			ance O2S rear <= 700.0 Ω	correctn		
			 Time after a catalyst purge phase >= 0.02 s 	ess of inf		
ate or commen			 Sis) General conditions Vehicle speed >= 10 km/h BARO not calibrated kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S rear ready O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s 1.8L Engine speed 1,280 - 3,008 RPM 2.0L Engine speed 1344 - 200 RPM 2.0L Engine speed 1344 - 200 RPM 	boliky with respect to the correctness of information in this		
Noto Elikolo	21		• Time after engine start > 230.0 – 1,000.0 s	9		
	ADITUGOD VO DOTOR	.5A/ T	• 1.8L Engine speed 1,280 – 3,008 RPM			
			• 2.0L Engine speed 1344 – 3008 RPM			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Lambda control value < 50.0% 			
			Deviation of lambda controller output @ start di- agnosis < 10.0%			
			 Deviation of lambda controller output during di- agnosis < 8.0 – 15.0% 			
			Fast trim control not calibrated			
			 Proportional part of secondary fuel control loop < 0.25 [-] 			
			Coasting function not active			
			Lambda adapta- tion not active			
			 Valve lift not equipped 			
			Temperature conditions:			
			• ~~ Signal (tmot) > 60° Col	G. Volkswagen	AG does not gua	
			• Signal (tans) >		ara	Tice or ac
		(1)	Modeled catalyst temperature once after engine start > 550° C			Ce Or and Hiddliff W.
		or in whole, is,	 Modeled catalyst temperature @ start of diagnosis 500 – 700° C 		47	ith respect to the
		rposes, in part	 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 			le con active
		or commercial pu	 Modeled catalyst temperature once after engine start > 550° C Modeled catalyst temperature @ start of diagnosis 500 – 700° C Modeled catalyst temperature during diagnosis 470 – 730° C Integrated air mass, catalyst temperature conditions fulfilled not calibrated g Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254,0 – 254.0 K 			de of accept any liability with respect to the cornections of information in this occurrence of accept any liability with respect to the cornections of information in this occurrence of accept any liability with respect to the cornections of information in this occurrence of accept any liability with respect to the cornections of information in this occurrence of accept any liability with respect to the cornections of information in this occurrence of accept any liability with respect to the cornections of the cornection
		S. S	Diff. between dy- namic and sta- tionary catalyst temperature @			1400 ittalitodo
			Start of diagnosis -254,0 – 254.0 K	0	MONAGIL	hiyo

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K			
			Modeled EGT @ O2S rear <= 1,201° C			
			Air mass conditions:			
			Air mass @ start of diagnosis 125.01 – 580.0 mg/stk			
			Air mass during diagnosis not calibrated mg/stka	gen AG does b		
		oo	 Air mass @ start of diagnosis 125.01 – 580.0 mg/stk Air mass during diagnosis not calibrated mg/stk MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated % Low dynamic conditions: Dynamic engine speed < 20 RPM Dynamic lambda controller output < 20.0% 	3/10	9 Uarantee Oraccen	
		of to the state of	MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			Nieblijt.
		le, ism	Load conditions:			With re
	.!	OUAN	• Air mass set point 125.01 – 580.0 mg/stk			spect to the
	ed III.		 Engine load not calibrated % 			correc
	CCCC		Accelerator pedal value not calibra- ted %			ctness of in
		mmerc	• For time not calibrated %			ormati.
		100 Pale Mills	Low dynamic conditions:			on in this go
		TO BUILD	 Dynamic engine speed < 20 RPM 		, Juguri	
		3/19/1/	Dynamic air mass < 25.01 mg/	Meway.	V VOTABINGO,	
		Japan Commercial State of	Dynamic lambda controller output < 20.0%	-DA nape.		
			Integrated air mass after dy- namic conditions are fulfilled > 20.0 g			
			Evap purge con- ditions			

DTC / De- scrip- tion	Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
of on mercial purposes, in part of in whole, is not be mile.	in less authorised by I	Olkswagen AG. Volkswa	 Case 1: Evap purge valve not calibrated Case 2: Canister load calculation not calibrated Evap purge valve not calibrated Case 3: Canister load not calibrated Evap purge valve not calibrated Evap purge valve not calibrated Close the gap conditions O2S rear voltage @ diagnosis start >= 0.55 V Integrated air mass to start diagnosis not calibrated g O2S front dynamic diagnosis separate not active 	ccentendiaplinamith respect to any	the correctness.	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
	Oxygen Sensors	Normalised lambda con-	General conditions				
	(O2S) Front Delay Path	vs. modeled	O2S front ready				
	Response Check	>= 1.0 [-]	Time after engine start not calibra- ted s				
			MAF to activate diagnosis func- tion not calibrated mg/stk				
			Integrated air mass per cylinder >= 0.42 – 2.0 kg				
			Vehicle speed not calibrated km/ h				
			Static condition				
			• Engine speed 1,056 – 3,008 RPM				
			• MAF per cylinder 15.0 – 150.0 kg/h				
			Vehicle speed not calibrated km/ h				
			Dynamic conditions				
			Dynamic engine Speed < 288 RPM	en AG does not			
		authorised	Dynamic torque < 80.0 Nm		Vuarantee Or-		
		The same of common to the same of common the same of common to the same of common the sam	cilled unless soci	 MAF per cylinder 15.0 – 150.0 kg/h Vehicle speed not calibrated km/h Dynamic conditions Dynamic engine speed < 288 RPM Dynamic torque < 80.0 Nm Absolute dynamic MAF < 70.0 kg/h Activation due to canister purge no purge Canister purge not active Canister purge wait ramp open Canister purge min purge Canister load known Canister purge n.a. 	7	accept any	
		ishot _{be}	Activation due to canister purge			SHEJWITH	
	i who	9	Canister purge no purge			respecti	
	part or i		Canister purge not active			otheco	
	Joses, in		Canister purge wait ramp open			rrectnes	
	ojal purp		Canister purge min purge			is of info	
		commo	Canister load known	Y Z		rmation,	
		TO STEWNING	Canister purge n.a.		20	in this	
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			Protecteds.	OKENSBEN AG.	3. Diag	nosis and Testing 5	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
			Moving mean val- ue canister load <= 1.80 [-]				
O2 Sen- sor Heat-	Oxygen Sensors (O2S) Heat- er Front Functional Check	• O2S ceramic temp. < 730° C	 O2S heater commanded on For time >= 10.0 s 	• 20.0 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.	
O2 Sen- sor	Oxygen Sensors (O2S) Rear Short To Ground	O2S sensor voltage < 0.15 V	• O2S heater active	0.6 s Continuous original continuous notised by Volksward notised by Volkswa	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.	Nte _e Or 3
O2 Sen- sor	Oxygen Sensors (O2S) Rear Short To Battery	O2S sensor voltage > 5.2 – 5.35 V	O2S heater ac- tive	• 0.5 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.	ccedt and liability with respect to the correctness of
500			Lot pivate or commercial purposes, in part or in whole, is not permitted.	Medby copyright.	BLW Selo19	DA nagewayloV Vam	recording in the correctness of information in this contraction in the
592	Rep. Gr.ST - G	eneric Scan Tool					

		Aolks	Wagon	AG does not			
	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
or commercial purposes, in part or in whole is horb.	R013 A O2 Sen- sor Slow Re- spons e - Rich to Lean Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Rear Rich To Lean Transition Response Check	• Gradient sensor voltage < 1,000.0 mV/s (arithmetic average)	 General conditions Vehicle speed >= 10 km/h BARO not calibrated kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S front ready Internal resistance O2S rear <= 700.0 Q Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s 1.8L Engine speed 1,280 - 3,008 RPM 2.0L Engine speed 1,344 - 3,008 RPM 2.0L Engine speed 1,344 - 3,008 RPM Deviation of lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller output during diagnosis < 8.0 - 15.0% Fast trim control not calibrated Proportional part of secondary fuel control loop < 0.25 [-] 	86.5 s No. O D Contespect to the correctness of information in this cock.	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 - Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Time Length	MIL Illumina- tion agen A.G. Volkswa	Component Diagnostic Procedure	
			Coasting function not active	oriso		an	ee or
			Lambda adapta- tion not active			7	COP RAIL
			Valve lift not equipped				
			Number of checks 2.0 [-]				
			Temperature conditions:				
			• ~~Signal (tmot) > 60° C				
			• ~~ Signal (tans) > -48° C				
			Modeled catalyst temperature once after engine start > 550° C				
			Modeled catalyst temperature @ start of diagnosis 500 – 700° C	luo.	_3.8.4	DA nagawaylo V Vol'ng	Wqo, Manuoo
			Modeled catalyst temperature dur- ing diagnosis 470 – 730° C	Alphydoo yd belo	Plo1 ^d	. DA negsweylo V voring	
			Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g				
			Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K				
			Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K				
			Modeled EGT @ O2S rear <= 1,201° C				
			Air mass conditions:				
			Air mass @ start of diagnosis 125.01 – 580.0 mg/stk				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Snotborning		 Air mass during diagnosis not calibrated mg/stk 		WildeliftsWith	
	or commercial purposes, in part or in whole, is not being the standard of the		 MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h 		center with respect to the correctness of information in this cock.	
	oses, inpar		 MAF per cylinder during diagnosis 35.0 – 135.0 kg/h 		e correctne	
	burp		Load conditions:		Ssof	
	commercial		 Air mass set point 125.01 – 580.0 mg/stk 		information	
	on ale or o		 Engine load not calibrated % 		in this oo	
	~	RUNADO WAGUNADO NA PORSE	Accelerator pedal value not calibra- ted %	Gurde	O THEUT	
		Sched by COPVIE	• For time not cali- brated s	NEXIO V KOTILLE		
			Low dynamic conditions:Dynamic engine			
			speed < 20 RPM			
			 Dynamic air mass < 25.01 mg/ stk 			
			Dynamic lambda controller output < 20.0%			
			 Integrated air mass after dy- namic conditions are fulfilled > 20.0 g 			
			Evap purge con- ditions:			
			• Case 1			
			 Evap purge valve not calibrated 			
			Case 2			
			 Canister load cal- culation not cali- brated 			
			 Evap purge flow not calibrated 			
			• Case 3			
			 Canister load not calibrated [-] 			

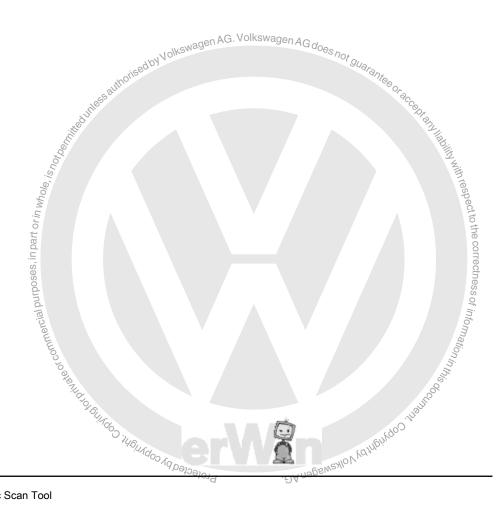
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure		
P013 B	Oxygen Sensors	Gradient sen- sor voltage <	General conditions	• 86.5 s	• 2 DCY	Check the Oxygen Sen-		
O2 Sen- sor	(O2S) Rear Lean To Rich Transi-	650.0 mV/s (arithmetic average)	 Vehicle speed >= 10 km/h 	Once / DCY		sor 1 After Catalytic Converter -		
Slow Re- spons	tion Re- sponse	avolugo)	BARO not cali- brated kPa			GX7 Refer to ⇒ "3.6.25		
e - Lean to Rich	oneen.		 Catalyst over- heating protec- tion not active 			Oxygen Sensor 1 After Catalytic		
Bank 1 Sen- sor 2			 Turbine over- heating protec- tion not active 			Converter GX7, Check- ing", page 1149.		
			 O2S rear ready 					
			O2S heater rear active AMSWagen A A	G. Volkswagen	AG _{does} ,			
			O2S front ready		os not guara			
		,uñ	• Internal resist- ance O2S rear <= 700.0 Ω			(eco _{racceo}		
		Not bermitte	 Time after a catalyst purge phase >= 0.02 s 			NA TROUBLE MARK		
		of philippe of commercial purposes, in part or in whole, is not being the principle of the	t or in whole, i	rt or in whole, i	 Integrated heat energy >= 1,600.0 - 3,000.0 kJ 			GX7, Checking". page 1149.
		ses, in par	 Time after engine start > 230.0 – 1,000.0 s 			correctne		
		ercial purpo	• 1.8L Engine speed 1,280 – 3,008 RPM			sss of inforn		
		areorcomm	 2.0L Engine speed 1,344 – 3,008 RPM 			nation in this		
		74010404B	 Lambda control value < 50.0% 			July July OR		
			Deviation of lambda controller output @ start diagnosis		A Nagewaylo V Vany	ss of information in this cook		
			Deviation of lambda controller output during di- agnosis < 8.0 – 15.0%	. •	v			
			Fast trim control not calibrated					
			 Proportional part of secondary fuel control loop < 0.25 [-] 					

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Coasting function not active 			
			 Lambda adapta- tion not active 			
			 Valve lift not equipped 			
			Number of checks 2.0 [-]			
			Temperature conditions:			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) > -48° Č			
			 Modeled catalyst temperature once after engine start > 550° C 			
			Modeled catalyst temperature @ start of diagnosis 500 – 700° C	n AG. Volkswag	len AG does no _t gu	arantee or a
			Modeled catalyst temperature dur- ing diagnosis 470 – 730° C			arantee oraccept and liability with leave
		t or in whole, is n	 Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g 			With technic
		cial purposes, in par	 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 – 254.0 K 			
		orinate or commercial purposes, in part or in whole, is not beling.	 Diff. between dynamic and stationary catalyst temperature during diagnosis 304.0 – 304.0 K 			Antony of the state of the stat
			O2S/rear <=	rW	A none	Throningo, f
			1,201 © 1,201 • Air mass conditions:	ld	. DA nagen AG.	
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/stk 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Air mass during diagnosis not calibrated mg/stk			
			 MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h 			
			 MAF per cylinder during diagnosis 35.0 – 135.0 kg/h 			
			Load conditions:			
			 Air mass set point 125.01 – 580.0 mg/stk 			
		V	Engine load not owe calibrated %	AG does not		
		des authorised by	 Accelerator pedal value not calibrated % 	946	Fantee Orace Orace Dianulia liability	
		dill.	 For time not cali- brated s 		POP RATULING	
	18,18	a.	Low dynamic conditions:			With I
	in whole		 Dynamic engine speed < 20 RPM 			espectto
	s, in part or		 Dynamic air mass < 25.01 mg/ stk 			the corre
	sesodund le		Dynamic lambda controller output < 20.0%			otness of ir
	rommerdi	a difference sauthorise of by V	 Integrated air mass after dynamic conditions are fulfilled > 20.0 g Evap purge conditions: Case 1 Evap purge valve not calibrated Case 2 Canister load cal- 		10%	with respect to the correctness of Information is
		THATOLO	 Evap purge con- 		Junok	
		OUIAdo	ditions:		(40) July	
		JUGUANODA:	• Case 1	, Ko	Meiner	
		-0/	e Evap purge valve not calibrated	TOIKEMSDENT		
			Case 2			
			 Canister load cal- culation not cali- brated 			
			Evap purge flow not calibrated			
			• Case 3			
			 Canister load not calibrated [-] 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Evap purge flow not calibrated 			
			Close the gap conditions:			
			 O2S rear voltage @ diagnosis start >= 0.55 V 			
			 Integrated air mass @ start di- agnosis not cali- brated g 			
			O2S front dynamic diagnosis separate not active			



DTC / Moni De- scrip- tion Descrip	egy teria and Thresh		Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P013	delay time > 0.9 s (arithmetic average) ran-le- ring, re-	 Vehicle speed >= 10 km/h BARO not calibrated kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S rear ready O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after ongine 	• 86.5 s • Once / DCY.G. V		- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking". page 1149 .	Aliab

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
			Coasting function not active				
			Lambda adapta- tion not active				
			Valve lift not equipped				
			Number of checks 2.0 [-]				
			Temperature conditions:				
			• ~~ Signal (tmot) > 60° C				
			• ~~ Signal (tans) > -48° C	ucwagen AG. V	olkswagen AG doc		
			Modeled catalyst temperature once after engine start > 550° C	Ka		s not guarantee or acceptal	
			• Modeled catalyst temperature @ start of diagnosis 500 – 700° C			74	Aliability w
		Š	 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 				
		al purposes, in part or in wh	Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g				
		, O	Diff. between dynamic and stationary catalyst temperature @start of diagnosis -254.0 – 254.0 K			L. E.	"Inthis of
			Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K	Profecte peloejoejo	-DA nagar	SAIN VORTE COPYTHING VOIKE	
			Modeled EGT @ O2S rear <= 1,201° C				
			Air mass conditions:				
			Air mass @ start of diagnosis 125.01 – 580.0 mg/stk				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions Air mass during diagnosis not calibrated mg/stk MAF per cylinder @ start of diagnosis 40.0 2 130.0 kg/h MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated % For time not calibrated s Low dynamic conditions: Dynamic engine speed < 20 RPM Dynamic lambda	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Air mass during diagnosis not calibrated mg/stk 			
		ophinate or commercial purposes, in part or in whole, is not be milled to the second of the second o	 MAF per cylinder @ start of diagno- sis 40.0 kg/h 	lkswagen AG d	Pes not guara	
		edun de saut	MAF per cylinder during diagnosis 35.0 – 135.0 kg/h		antee of	CC _C C _D
		THE STATE OF THE S	 Load conditions: 			THE STATE OF THE S
		iole, is not be	 Air mass set point 125.01 – 580.0 mg/stk 			litywithrest
		t orinwt	 Engine load not calibrated % 			ecttothe
		ses, in par	 Accelerator pedal value not calibra- ted % 			ecorrectne
		ialpurpo	 For time not cali- brated s 			ess of inf
		sommerc	Low dynamic conditions:			ormation
		To alenit	Dynamic engine speed < 20 RPM			in this
		**************************************	Dynamic air mass < 25.01 mg/ stk		, ido.	;ualifi
			Dynamic lambda controller output < 20.0% out	.9Ansg.	EWRANO V VOTARBIN UPOC	
			 Integrated air mass after dy- namic conditions are fulfilled > 20.0 g 			
			 Evap purge con- ditions: 			
			Case 1			
			Evap purge valve not calibrated			
			• Case 2			
			 Canister load cal- culation not cali- brated 			
			Evap purge flow not calibrated			
			• Case 3			
			 Canister load not calibrated [-] 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Evap purge flow not calibrated			
			Close the gap conditions:			
			 O2S rear voltage @ diagnosis start >= 0.55 V 			
			 Integrated air mass @ start di- agnosis not cali- brated g 			
			O2S front dynamic diagnosis separate not active			



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P013 F	Oxygen Sensors	Sensor signal delay time >	General conditions	• 86.5 s	• 2 DCY	Check the Oxygen Sen-
O2 Sen- sor	(O2S) Rear Lean To Rich Transi-	0.9 s (arith- metic aver- age)	• Vehicle speed >= 10 km/h	DCY		sor 1 After Catalytic Converter -
De- layed Re-	tion De-	3 /	BARO not cali- brated kPa			GX7 Refer to ⇒ "3.6.25
spons e - Lean	Monitoring, Delay Measure-		Catalyst over- heating protec- tion not active			Oxygen Sensor 1 After Catalytic
to Rich Bank 1 Sen-	k		Turbine over- heating protec- tion not active			Converter GX7, Check- ing", page 1149
sor 2			O2S rear ready			
			O2S heater rear active			
			O2S front ready			
		rt or in whole, is not in which in which is not in which in which in which in which in which is not in which i	• Internal resist- ance O2S rear <= 700.0 Ω			
			• Time after a cata- lyst purge phase >= 0.02 s	AG _{does not} gue	Prantie	
			 Integrated heat energy >= 1,600.0 - 3,000.0 kJ 		e or accept and lies	
	ole, is no		 O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s 1.8L Engine speed 1,280 - 3,008 RPM 		With resi	
	art or in wh		• 1.8L Engine speed 1,280 – 3,008 RPM			ect to the c
	dui, sesod.		• 2.0L Engine speed 1,344 – 3,008 RPM			orrectness
	rcial pul		 Lambda control value < 50.0% 			of infon
	mmo	o die Vi	Deviation of lambda controller output @ start di- agnosis < 10.0%		Solow	nationing
		Ctot Blitton Mentdood	 1.8L Engine speed 1,280 – 3,008 RPM 2.0L Engine speed 1,344 – 3,008 RPM Lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller output during diagnosis < 8.0 – 15.0% Fast trim control not calibrated 	o we show w	Jubingo, instituo,	
			Fast trim control or not calibrated	Anapawa		
			Proportional part of secondary fuel control loop < 0.25 [-]			

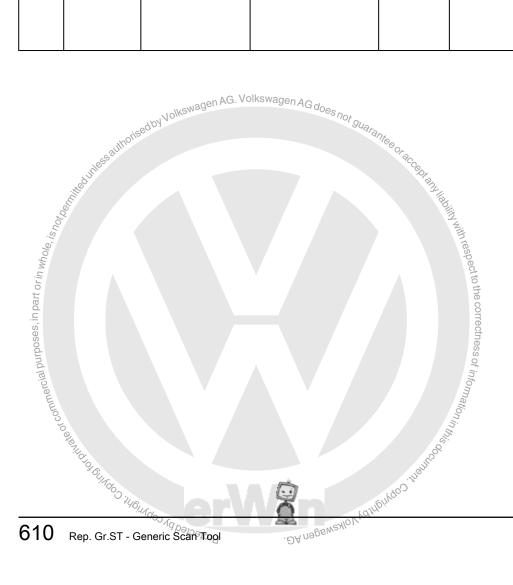
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Coasting function not active 			
			 Lambda adapta- tion not active 			
			 Valve lift not equipped 			
			Number of checks 2.0 [-]			
			Temperature conditions:			
			 ~~ Signal (tmot) > 60° C 	cedby Volkswa	gen AG. Volkswag	len AG does not guara
			• ~~ Signal (tans) > -48° C	onise		·an
			 Modeled catalyst temperature once after engine start > 550° C 			
			Modeled catalyst temperature @ start of diagnosis 500 – 700° C			
			 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 			
			 Integrated air mass, catalyst temp, conditions fulfilled not cali- brated g 			
			 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 K 	HOUNDON A	erW	Ten AG does not guarant
			 Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K 	19,00,00	Joi ^q	OK RANSOGU YG.
			 Modeled EGT @ O2S rear <= 1,201° C 			
			 Air mass conditions: 			
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/stk 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Air mass during diagnosis not calibrated mg/stk			
			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h			
			MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			
			Load conditions:			
		adbyVol	 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 580.0 n Amg/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated s 	G does not gyar		
		aless authorisee	Engine load not calibrated %	4/a	niego _{faco} o.	
	400	itika dynas sautronised by Voll	Accelerator pedal value not calibra- ted %		O'RAJU HODIII	
	0/e, is not		For time not calibrated s		ZZ	
	t orinwh		Low dynamic conditions:			pect to th
	in par		Dynamic engine speed < 20 RPM			e corre
	, purposes,		Dynamic air mass < 25.01 mg/ stk			octness of
	commercial		Dynamic lambda controller output < 20.0%		, don	espect to the correctness of information
		Salid to Gills	Integrated air mass after dy- namic conditions are fulfilled > 20.0		in the state of th	
		A SUIT OF BUILD ON THE INDICATE OF SALES	• Evap purge conditions: • Case 1	obews/lov/vol/swage	bundoo jabahtoo ja	
			Evap purge valve not calibrated			
			• Case 2			
			Canister load cal- culation not cali- brated			
			Evap purge flow not calibrated			
			• Case 3			
			Canister load not calibrated [-]			

	Jetta/Beetle Generic Sca	e 2013 ➤ an Tool - Edition 12	2.2017 _{who} rised by Volks	_W agen AG. Volk	kswagen AG does r	Pot gu _{arantes}
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		commercial purposes, in part or in whole, is n	 Evap purge flow not calibrated Close the gap conditions: O2S rear voltage @ diagnosis start >= 0.55 V Integrated air mass @ start diagnosis not calibrated g O2S front dynamic diagnosis separate not active 			ith with respect to the second mation in the second
P0140 O2 Sen- sor Circuit No Activi- ty De- tected Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Rear Open Cir- cuit	• Internal resistance of O2S (binary) > 65,534.0 Ω	ic diagnosis separate not active	• 2.5 s • Continuous	• 5 DCA	 Check the Oxygen Sen- sor 1 After Catalytic
P0141 O2 Sen- sor Heat- er Cir- cuit Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Heat- er Rear Out Of Range High	• Internal resistance of O2S (binary) 700.0 – 65,534.0 Ω	 O2S heater commanded on For time >= 10.0 s 	• Once /	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
Fuel Tim-	Fuel Injection Valves Out Of Range Low Fuel Injection Valves Out Of Range High	 Boost voltage Boost voltage 50.0 V Boost voltage 75.0 V 	• Engine running >= 0.3 s	• 3.6 s • Continuous	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Sys- tem Too	Fuel Sys- tem Too Lean	Lambda con- troller output > 35.0%	 Lambda control closed loop Air mass > 60.00 	• 60.0 s • Continuous	• 2 DCY	Check vac- uum lines visually for leaks.
Lean Bank 1			mg/stk • Engine speed > 576 RPM • 1.8L ECT @ cyl-			Check the intake system visually for leaks (false)
		AY	inder block > 55° C C • 102:0L ECT @ cyl-	en AG does not	gus	air). - Check the fuel pressure
		, edunias sauthoris eu	 1.8L ECT @ cylinder block > 55° C 2.0L ECT @ cylinder block > 60° C IAT @ manifold > -48° C 		arantee or acceptan	and delivery quantity. Re- fer to fuel system me- chanical test-
		all the search of search o	AAT > -48° CEvap purge valve closed			ing in ⇒ "3.1 Pre- liminary Check", page 13 and/
	part or in who		 Canister load <= 1.20 [-] Evap purge flow at max. value 			or to appro- priate repair manual.
	npurposes, in		Depending on canister purge min:			- Check the Fuel Pres- sure Sensor - G247 Re- fer to
	S	orcomme	 Lower limit of lambda controller output not cali- brated 			3.6.16 Fuel Pres- sure Sensor G247,
		SEALING COLLEGE	 Upper limit of lambda controller output not cali- brated 	*	400 juainos	Checking", page 1131 Check the Fuel Injec-
		White out the state of common state of common state of the state of th	• Evap purge flow p _{o Ag} at min. value ^{ந்து} ்து _{ப்ப}	. ĐA nəpsweylo	Mangingo Jingung	tors . Refer to ⇒ "3.6.14 Fuel Injec- tors , Check- ing", page 1127 .
						- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25
						Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
						- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152 . - Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing",



System Too Rich Too Rich Bank 1 System Too Rich Bank System Too Rich Bank System Too Rich Bank System Too Rich Bank System S	nponent Di- ostic Proce- dure	Cor agn	llumina- tion	MIL II	onitoring Time _ength	Secondary Parame- ters with Enable Conditions	Malfunction Cri- teria and Thresh- old Value	Monitor Strategy Description	DTC / De- scrip- tion
Canister load <= 1.20 [-] Evap purge flow at max. value Depending on canister purge min: Lower limit of lambda controller output n.a. Upper limit of lambda controller output n.a. Upper limit of lambda controller output n.a. Evap purge flow at min. value Check Fuel I tors. I ⇒ "3.6" Fuel I tors, ing". page Check Fuel I tors. I ⇒ "3.6" Fuel I tors. I cataly convergence output n.a. Evap purge flow at min. value	"3.1 Pre- minary heck", age 13 and/ r to appro- riate repair ranual. heck the uel Pres- ure Sensor - 247 Re- er to "3.6.16 uel Pres- ure Sensor 247,	ff so contains a conta			Contin- uous	closed loop Air mass > 60.00 mg/stk Engine speed > 576 RPM 1.8L ECT @ cylinder block > 55° C 2.0L ECT @ cylinder block > 60° C IAT @ manifold > -48° C AAT > -48° C Oil dilution not detected Evap purge valve closed	troller output <	tem Too	P0172 Sys- tem Too Rich Bank
Segon de la	"3.6.26 xygen Sen- or #Before atalytic onverter X10, hecking", age 1152. heck the uel Delivery nit - GX1- / uel Pump ontrol Mod-					Canister load <= 1.20 [-] Evap purge flow at max. value Depending on canister purge min: Lower limit of lambda controller output n.a. Upper limit of lambda controller output n.a. Evap purge flow at min. value	or commercial purposes, in part or in whole, is not being the part of in whole, is not being the part of the part		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		part or in whole, is not be milled to the milled the mi	_{že} dby Volkswagen AG. Volks	wagen AG does	not guarantes orace	ule J538, Testing", page 1125. Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page \$123.
	Fuel Pressure (LP) Sensor Short To Battery / Open Circuit	High fuel pressure sensor voltage > 4.80 V	Protected by Copyright	• Continuous		- Check the Fuel Pressure Sensor-G247. Refer to \$\frac{3}{2}\frac{6}{1}\frac{6}{1}\frac{6}{2}\frac{47}{1}\frac{6}{1}\frac{6}{2}\frac{47}{1}\frac{6}{1}\fr

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Fuel Rail Pres- sure Sen- sor Circuit Rang e/Per- for-	Fuel Rail Pressure (FRP) Out Of Range High	• Fuel pressure > 27,900.09 kPa	 Engine speed > 608; < 8,160 RPM Time after engine start > 5.0 s 	5.0 sContinuous	• 2 DCY	- Check the Fuel Pres- sure Sensor - G247 Re- fer to ⇒ "3.6.16 Fuel Pres- sure Sensor G247, Checking", page 1131.
e Bank 1	a different services authoric	_{se} dby Volkswagen AG. V	olkswagen AG does not guar	antee or accept and le	• 2 DCY	- Check the Fuel Pressure Regulating Valve N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.
Fuel Rail Pres- sure Sen- sor Circuit Low Bank	Fuel Pressure (LP) Sensor Short To Ground	 High fuel pressure sen- sor voltage < 0.20 V 		2.0 sContinuous	DCY Sactto the correctness of information in the	- Check the Fuel Pressure Sensor-G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131.
	TO BRAIL OF BUILD OF WAR	Proteologoby Copyrig	. DA negswe _M oV _V o _V	Johnson, ingritory	10 th	- Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276. Checking", page 1129.

DTC / Monitor De- scrip- tion Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P01C Fuel Rail 4 Pressure Fuel (FRP) Sen- sor rational- ity check low	 Deviation lambda of controller included adaptation < -45.00 % And High pressure 	 General: Engine speed 608 – 1,088 rpm Fuel mass set-point 1.99 – 20.01 mg/stk Time after change to DFI not equipped [s] Time after engine start > 5.0 s Engine warm-up not calibrated Catalyst heating not calibrated Catalyst purge not calibrated Lambda control closed loop Evap purge functionality diagnosis not active Fuel pressure setpoint gradient <= 200.06 kPa And Depending on low dynamic conditions: Fuel mass setpoint lower range > 1.99 mg/stk For time >= 5.0 s Fuel mass setpoint upper range < 100.32 – 172.41 mg/stk Fuel mass setpoint gradient -1389.00 – 2.20 mg/stk For time >= 1.2 s And depending on canister purge: Canister load <= 	• 10.0 s • Continuous	• 5 DCA	- Check the Fuel Pressure Sensor-G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131 Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129. Natural Pressure Regulator Valve N276, Checking", page 1129. Natural Regulator Valve N276, Checking
		0.70 - • Or			

DTC / De- scrip- tion	Monitor Strategy Description	teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Evap purge valve not active or closed			



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure			
	Fuel Rail Pressure	Deviation lambda of	General:						
	(FRP) Sen- sor rational-	controller in- cluded adap-	• Engine speed 608 – 1,088 rpm						
	ity check high	tation > 30.00 % • And	% point 4.01 – 29.99						
		High pressure controller out- put < -10 mg	Time after change to DFI not equipped [s]	i. Volkswagen z	6.				
			Time after engine start > 5.0 s		G does not guarant				
		, International Control of the Contr	Engine warm-up			COP CCOPP			
			Catalyst heating not calibrated			BW lightlift			
		Ne, is not,	Full load not cali- brated			ywith res			
		t orin who	Catalyst purge not calibrated			specttot			
		, inpart	Lambda control closed loop		hecorre				
		sesodind	Evap purge func- tionality diagno- sis not active			ctnessof			
		to the purposes, in part or in whole, is not being the purposes, in part or in whole, is not been in the purposes.	Sommercial	commercial	ommercial	Fuel pressure setpoint gradient <= 200.06 kPa			information
			• And	. Volkswagen A G does not gua		inthi			
			Depending on low dynamic con- ditions:			, instituted			
			Fuel mass set- point lower range > 1.99 mg/stk	.:DA	мэдгмэдо V V ОТКЕМ 20 EU	Kdos			
			• For time >= 5.0 s	9.					
			• Fuel mass set- point upper range < 100.32172.41 mg/stk						
			Fuel mass set- point gradient -1389.002.20 mg/stk						
			• For time >= 1.2 s						
			And depending on canister purge:						
			• Canister load <= 0.70 -						
			• Or						

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Evap purge valve not active or closed			
	Fuel Injection Valves Open Circuit Fuel Injection Valves Short Circuit	 Fault pattern for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V Fault pattern for short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.0° CRK Continuous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 .



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running				
		• And					
		Injector low side voltage < 2.0 V		awagen AG. V	olkswagen AG doo		
		Injector low side switch current > 25.0 A	ass authorised by Vo	KSWao	906	s not guarantee or acc	
		• Or	edunie			90 j	,
		Injector low side voltage < 2.0 V	Is not positive				Hiddilles
		• Injector high side switch current > 25.0 A					
		• Or iii					
		• Injector low side voltage ≤ 2.0 V					
		Injector low side switch current (hardware values) > 9.0 – 14.0	all works and the season of th				, mison
		• Or	MOTOTO STATE			auro	,
		• Injector volt- age < 2.0 V	MEINGO MEINGO	ler\	9	SHOV WITH THE WAR	
		• Injector low side switch current > 25.0 A	\sim Λ_Q	Profected	ısgen AG.	^(E) /10 L	
		• Or					
		• Injector volt- age < 2.0 V					
		Injector low side switch current (hard- ware values)> 9.0 – 14.0					
		• Or					
		• Injector load resistance to ground and battery > 20.0 Ω					

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0202 Fuel Injec-	 Injector low side switch current > 25.0 A Or Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current > 25.0 A or power stage temperature > 150° C Fault pattern 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s A. Volkswagen AG does not g Engine stop not 	8 640 ns	• 2 DCY	Check the
Cylinder 2 Injector "A" Circuit Fuel Injection Valves Open Circuit Fuel Injection Valves Short Circuit	for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V Fault pattern for short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms	ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s	CRK Continuous	d liability with respect to the correctness of information in this co.	Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

				I	I	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Di- agnostic Proce- dure
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running			
		• Injector low side voltage < 2.0 V				
		Injector low side switch current driver stage internal value				
		• Injector low side voltage < 2.0 V	agen AG. Volkswagen AG	do		
		Injector high side switch current driver stage internal value	_{swage} n AG. Volkswagen AG	ades not guaran	Reof accopy	
		• Injector low side voltage < 2.0 V			32 libbility 43;	
	in part or in whole, is not one whole, is not be the whole of the state of commercial purposes, in part or in whole, is not be the state of commercial purposes.	Injector low side switch current (hard- ware values) driver stage internal value				spect to the correctness of in
	onrposes	• Injector volt- age < 2.0 V				ctness of
	e or commercial I	Injector low side switch current driver stage internal value			""ationinth	inform
	*6	age < 2.0 V			ishiro s.	
		Injector low side switch current (hardware values) of driver stage internal value	Protect	дигол Логкемад	Takion in this cook to the take the take to the take the	
		• Injector load resistance to ground and battery > 20.0 Ω				
		Injector low side switch current driver stage internal value				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current driver stage internal value 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	en A C ~		
P0203 Cylinder 3 Injector "A" Circuit	Fuel Injection Valves Open Circuit Fuel Injection Valves Short Circuit	cuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.00 CRK Continuous	2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking" . page 1127 . The correctness of information in the correctness of
		ELLO TO BEAUTO OF THOUSE THOUSE	Protected by co	.DAnagenAG.	Voltigit 400 jrantug	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injec- tion Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running Wolkswagen AG. Volkswagen AG.	gen AG does no	*9u _{ara}	
		• Injector low side voltage < 2.0 V			Antecorace of a	
		Injector low side switch current driver stage internal value Injector low				liability with resp
	Č	• Injector low side voltage < 2.0 V				ecttothecc
	. Yournoses, in part	Injector high side switch current driver stage internal value				orrectness of info
		Injector low side voltage < 2.0 V				rmationint
		Injector low side switch current (hardware values) driver stage internal value.	Secondary Parameters with Enable Conditions • Engine running ON YORKSWAGEN AG. Volkswagen AG.		Walnetoo jashu	
		• Injector volt- age < 2.0 V	Profected A.	.NKSWagen AG.	,	
		Injector low side switch current driver stage internal value				
		Injector volt- age < 2.0 V				
		Injector low side switch current (hard- ware values) driver stage internal value				
		• Injector load resistance to ground and battery > 20.0				
		Injector low side switch current driver stage internal value				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current driver stage internal value 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	. owagen A	3. Volkswagen AG	da.
Cylin- der 4	Fuel Injection Valves Open Circuit	 Fault pattern for open cir- cuit via power stage diagno- sis detected Injector low side voltage < 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not 	• Continuous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127
	Fuel Injection Valves Short Circuit	rent rise time during peak phase < 0.064	Fingine speed 7,000 RPM Injection time not calibrated s			
			See The State of Buildon in Birdon	Protected by	.ĐAng	± "3.6.14 Fuel Injectors, Checking", page 1127.

		esau		Or	20	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Length	MHL Illumina-	dure
	Fueldnjection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running		with respect to the	
	ses, in par	• Injector low side voltage < 2.0 V			correctne	
	or commercial purposes, in part or	Injector low side switch current driver stage internal value			with respect to the correctness of information in this could be a second to the correctness of information in this could be a second to the correctness of information in the co	
	O STRAIN TO THE	• Injector low side voltage < 2.0 V			Shroo	
		Injector high side switch current driver stage internal value	DIA DA NA BEN PTO	PAIO V VOTH BINGOS	, V	
		• Injector low side voltage < 2.0 V				
		Injector low side switch current (hard- ware values) driver stage internal value				
		Injector volt- age < 2.0 V				
		Injector low side switch current driver stage internal value				
		Injector volt- age < 2.0 V				
		Injector low side switch current (hard- ware values) driver stage internal value				
		• Injector load resistance to ground and battery > 20.0 Ω				
		Injector low side switch current driver stage internal value				

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DTC / De- scrip- tion	Strategy	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Mercial purposes, in part or in whole, is not the board of the board o		 Injector load resistance to ground and battery > 20.0 Ω Injector high side switch current driver stage internal value 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	N with respect to the correctness of		
Pedal Posi- tion Sen-	sition Sensor (TPS) 2 Rationality Check	Normalised difference between measured and modeled value of mass air flow from TPS 2 >= 1.0 [-] Relative mass air flow integral from TPS 2 > 60.0 [-]	Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) not active Augustin Angusting Angusting of the control of throttle exchange or checksum error) not active	 Contin- 	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
Throt- tle/		Throttle position sensor 2 voltage < 0.17 V		0.2 sContinuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
Throt- tle/		tion sensor 2 voltage > 4.83 V		0.2 s Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0234 Tur- bo- charg- er/Su- per- charg- er "A" Over- boost Con- dition	charger (TC) Boost Pressure Control Out Of Range High	 Boost pressure > calculated max. plausible value Boost pressure deviation < 209.90 – 265.0 kPa Turbocharger protection active 	 Engine running Accelerator pedal value > 0.0% Fuel cut off n.a. Difference between boost pressure and barometric pressure >= 20.0 kPa 	uous	• 2 DCY	 Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31 , Checking", page 1115 . Check the
		ites autorised by Volkswa	gen AG. Volkswagen AG doe	as not guaranteed	r accept and liab.	Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Ac- tuator V465, Checking", page 1113
Tur- bo- charg- er/Su- per- charg-	Turbo-Scharger (TC) Boost Pressure Sensor Engine Stand- ing Cross	Diff. turbo-charger boost pressure vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa Diff. BARO vs. MAP <= 7.50 kPa MAP <= 7.50 kPa Diff. BARO vs. MAP <= 7.50 kPa	 Case 1: engine stop during DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle n.a. For time >= 10.0 s Case 2: engine stop @ start of DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle n.a. 	3.0 s Continuous	• 2 DC Valith respect to the correctness of information in this ook that the correctness of the corre	- Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 . - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Turbo- charger (TC) Boost Pressure Sensor ECM Keep Alive-Time: Cross Check		 Engine stopped Vehicle speed < 1 km/h ECM keep alivetime 10.0 – 6,553.5 s Time after engine stop >= 5.0 s BARO sensor voltage 0.20 – 4.80 V MAP sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V 	wagen AG. Vol	«swagen AG does	Pot guaran
Tur- bo- charg-	Turbo- charger (TC) Boost Pressure Sensor Short To Ground	Turbocharger boost pressure sensor voltage < 0.20 V	aduniessault	• 0.5 s • Continuous	• 2 DCY	- Check the Charge Air Pressure Sensor - G31- Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 Check the Actuator - V465- Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113
			to Blildon Whom you you	Protecte	-DAnagawa	HOVE THE MAN WASHINGTON

		Jolkswagerr	does nor			
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0238 Tur- b0- charg- er/Su- per- charg- er Boost Sen- sor "A" Circuit	Turbo- charger (TC) Boost Pressure Sensor Short To Battery Plus	Turbocharger boost pres- sure sensor voltage > 4.80 V		Oza s Continuous ous	• 2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .
High High	* OLIA CIO			or mormation in this could be seen that the second	SOR in	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
P025 A Fuel Pump Mod- ule "A" Con- trol Cir- cuit/ Open	Fuel Pump (FP) Open Circuit	Signal voltage lower range > 1,92 - 2.21 V Signal voltage upper range (hardware values) < 2.84 - 3.25 V	PWM 9.80(4)*** 92.20%\\	0.5 sContinuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 .
P025 C Fuel Pump Mod- ule "A" Con- trol Circuit Low	(FP) Short To Ground	• Signal voltage < 1.92 – 2.21 V (hardware values)	 Commanded PWM 9.80 – 92.20% Fuel pump commanded off 	• 0.5 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
D Fuel	Fuel Pump (FP) Short To Battery Plus	 Power stage temperature > 160.0 - 200.0° C Signal current > 100 - 180 mA 	Commanded PWM 9.80 – 92.20% Fuel pump commanded on	0.5 s Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
	Fuel Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis de- tected Injector volt- age < 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.0° CRK Continuous	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127
.60	Injection Valves Short To Ground (Low Side)	Injector driver voltage < 2.0 V Injector driver high side switch current < 25.0 A AG. Volkswag frijector driver low side switch current < 25.0 A 25.0 A	ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not en A calibrated ms	720° CRK Continuous		
or in whole, is not be mile du	Fuel Injection Valves Short To Ground (High Side)	 Injector driver voltage < 2.0 V Injector driver high side switch current > 25.0 A 		edram liabilis with respect to the		
P0262 Cylinder 1 Injector "A" Circuit High	Fuel Injection Valves Short To Ground (High Side) Fuel Injection Valves Short To Battery Plus	 Fault pattern for short to battery plus via power stage diagno- sis detected Injector volt- age > 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	CRK Continuous of information.	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Short To Battery Plus (Low Side)	 Injector driver voltage > 2.0 V Injector driver low side switch current > 25.0 A 	 ECT @ cylinder block >= -30° C Engine speed 	• 720° CRK • Continuous		
	Injection Valves Short To Battery Plus (High Side)	 Injector driver voltage > 2.0 V Injector driver high side switch current > 25.0 A 	7,000 RPM Injection time not Volk calibrated ms		80	
P0264 Cylin (Cylin Circuit Low) Cylin (Circuit Low) Circuit Low)	Fuel Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis de- tected Injector volt- age < 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.0° CRKContinuous	DCY Notespect to the correctness of i	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 .
amercial	Injection Valves Short To Ground (Low Side)	 Injector driver voltage < 2.0 V Injector driver high side switch current < 25.0 A Injector driver low side switch current < 25.0 A 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	• 720° CRK • Continuous	nformation in this o	
	Fuel Injection Valves Short To Ground (High Side)	 Injector driver voltage < 2.0 V Injector driver high side switch current > 25.0 A 				
	Fuel Injection Valves Short To Battery Plus	 Fault pattern for short to battery plus via power stage diagno- sis detected Injector volt- age > 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	 8,640.0° CRK Continuous 	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Short To Battery Plus (Low Side) Injection Valves Short To Battery Plus (High Side)	 Injector driver low side switch current > 25.0 Å Injector driver voltage 2.0 V 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	• 720° CRK • Continuous		ky with respect
P0267 Cylinder 3 Injector "A" Circuit Low	Fuel Injection Valves Short To Ground	power stage diagnosis de- tected • Injector volt- age < 2.0 V	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed ≤ 7,000 RPM Injection time not calibrated s 		<u>~</u>	- Check the Fuel Injectors Refer to
	Injection Valves Short To Ground (Low Side)	 Injector driver voltage < 2.0 V Injector driver high side switch current < 25.0 A Injector driver low side switch current < 25.0 A 	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	• 720° CRK • Contin- uous		
	Fuel Injection Valves Short To Ground (High Side)	 Injector driver voltage < 2.0 V Injector driver high side switch current > 25.0 A 				
P0268 Cylin- der 3 Injec- tor "A" Circuit High	Fuel Injection Valves Short To Battery Plus	 Fault pattern for short to battery plus via power stage diagnosis detected Injector voltage > 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.0° CRK Continuous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Short To Battery Plus (Low Side)	 Injector driver voltage > 2.0 V Injector driver low side switch current > 25.0 A Injector driver 	 ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	• 720° CRK • Continuous		
D0070	Valves Short To Battery Plus (High Side)	voltage > 2.0 V Injector driver high side switch current > 25.0 A	Tud koummer cial pur	0.040.00		
P0270 Cylin- der 4 Injec- tor "A" Circuit Low	Fuel Injection Valves Short To Ground	 Fault pattern for short to ground via power stage diagnosis de- tected Injector volt- age < 2.0 V 	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	• 8,640.0° CRK •∕₀ Contin- uous,		- Check the Fuel Injectors . Refer to ⇒ "3.6.14" - Tuel Injectors . Checking". page 1127 .
	Injection Valves Short To Ground (Low Side) Fuel Injection Valves Short To Ground (High Side)	 Injector driver voltage < 2.0 V Injector driver high side switch current < 25.0 A Injector driver low side switch current < 25.0 A Injector driver voltage < 2.0 V Injector driver driver voltage < 2.0 V 	ECT @ cylinder block >= -30° C Engine speed <	720° CRK Continuous		
P0271 Cylin- der 4 Injec- tor "A" Circuit High	Fuel Injection Valves Short To Battery Plus	high side switch current > 25.0 A • Fault pattern for short to battery plus via power stage diagno- sis detected • Injector volt- age > 2.0 V	 Engine stop not active ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated s 	8,640.0° CRK Continuous	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Injection Valves Short To Battery Plus (Low Side) Injection Valves Short To Battery Plus (High Side)	Injector driver voltage > 2.0 Injector driver low side switch current > 25.0 A Injector driver voltage > 2.0 Injector driver high side switch current > 25.0 A	 Engine running ECT @ cylinder block >= -30° C Engine speed < 7,000 RPM Injection time not calibrated ms 	• 720° CRK • Continuous		with respect to the correctness of information in this oc
P0299 Tur- bo- charg- er/Su- per- charg- er "A" Un- der- boost Con- dition	Turbo- charger (TC) Boost Pressure Control Out Of Range Low	Boost pressure < calculated min. plausible value Boost pressure deviation > 5.0 kPa	 Engine running Turbo charger bypass valve closed For time >= 1.0 s Pressure ratio before charger set point > 1.30 [-] For time >= 1.2 - 1.9 s Engine speed > 2,208 - 2,750 RPM Barometric pressure > 73.0 kPa ECT > -10° C No cylinder is shut off Fuel tank level not calibrated % 		• 2 DCY	Check the

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
	Intake	Turbo charger	Engine running	• 0.01 s			
	Manifold Adaptive	actuator set point >= 17.0	Conditions:	• Contin-			
	Value Check	_ 20.0%	• For time >= 0.5 s	uous			
		Difference be- tween filtered boost pressure and basic boost pressure > 40.01 kPa					
			Difference be- tween filtered boost pressure set point and ba- sic boost pres- sure > 40.01 kPa	by Volkswagen /	kG. Volkswagen _A	G does not gu _{er}	
			control deviation < 20.0 kPa			arantee or a	Copy of the copy o
			Boost pressure set point < 16.0 kPa				W. Lippling M.
			• Actual boost pressure < 30.0 • Difference between current boost pressure set point and basic boost pressure > 3.0 kPa			G does not guarantes or a	Mrespections
			• ECT > -20° C				Infon
			• AT @ throttle >				mationin
			• Engine speed 2,500 – 6,800 RPM				Sur Sur
			• Conditions			Coby	Ž
			 RPM Conditions For time >= 5,000.0 ms Difference be- 	Oolectedbyco	Q	эбемэмо Лацбіл,	
			Difference be- tween actual tur- bocharger speed and maximum turbocharger speed set point > 9,003 RPM	- vad	.ĐA,		
			Conditions:				
			• For time >= 1,000.0 ms				
			No gear shift				
			Fuel cut off not active				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Number of cylinders with catalyst damaging misfire >= 2.0 [5] Leading the common of the common of the catalyst damaging misfire in	• Catalyst damaging misfire detected	• 200 rev • Continuous	ately	with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking". page 1133 .

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0301 Cylinder 1 Misfire Detected	Misfire Crankshaft Speed Fluc- tuation (Sin- gle Or Multi- ple)	1.8L Catalyst	 Initial engine speed > 550 RPM Engine speed > 550 RPM Engine speed < 6,848 RPM Time after engine start not calibrated s 1.8L Engine load > 5.26 - 44.49 % 2.0L Engine load > 4.36 - 47.00 % Depending on ECT @ cylinder block @ engine start <= -48° C Then activation if ECT @ cylinder block >= 20° C ECT @ cylinder block @ engine start > -48° C Fuel cut off not active Single fuel cut off not active Number of fade out cylinders < 2.0 [-] Dynamic manifold air pressure not calibrated kPa Dynamic throttle position not calibrated ° TPS/s Dynamic of engine load not calibrated % Engine not calibrated Engine speed not 	• 1,000 rev • Continuous		may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. - Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/ or to appropriate repair manual. - Check the Fuel Injectors . Refer to
			Dynamic of ignition angle @ idle speed not calibrated ° CRK			⇒ "3.6.14 Fuel Injectors, Checking", page 1127.
						Check the Ig- nition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Misfire	Emission threshold misfire within 4,000 rev: Emission threshold misfire rate (MR) > 2.40 % Catalyst dam-	Dynamic of ignition angle not calibrated ° CRK Rough road not detected Initial engine Initial engine	• 4 x 1,000 rev	agen AG. Volkswa	with Power Output Stage . Refer to ⇒ "3.6.17" lg nition Coils With Power Output Stage . Checking". page 1133 .
Cylin- der 2 Mis- fire De- tected	Crankshaft Speed Fluc- tuation (Sin- gle Or Multi- ple)	age misfire: • Catalyst damaging misfire rate > 4.72 - 20.83 %	speed > 550 RPM			spark plugs visually for signs of foul- ing. - Check the in- take system visually for leaks (false air).

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Emission threshold mis- fire within 1,000 rev: Emission threshold mis- fire rate (MR) > 2.25 % 	 Time after engine start not calibrated s Engine load > 6.54 - 43.0% Depending on ECT @ cylinder block @ start 	rev • Continuous		Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than nor-
		 Emission threshold mis- fire within 4,000 rev: Emission threshold mis- fire rate (MR) > 2.40 % 	 ECT @ cylinder block @ engine start <= -48° C Then activation if ECT @ cylinder block >= 20° C ECT @ cylinder block @ engine start > -48° C Fuel cut off not active Number of fade 	uous	not gun	mal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal.
		es, in part or in whole, is not belinging the part of in whole, in which it is not belinging the part of in which is not belinging the part of in which it is n	 out cylinders < 2.0 [-] Dynamic manifold air pressure not calibrated kPa Dynamic throttle position not cali- 		drantee or acq	and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3"1 Preliminary Check", page \$3 and/or to appro-
		oommercial purposes, i	 brated ° TPS/s Dynamic of engine load not calibrated % Engine not calibrated Engine speed not calibrated RPM Dynamic of ignition angle @ idle speed not calibrated ° CRK Dynamic of ignition angle not calibrated ° CRK Rough road not detected 	.ĐA nagaw	SMO V VOT WE WAR	priate repair manual. Check the Fuel Injectors Refer to 3 6.14 Fuel Injectors Checking". Page 1127 Check the Ignition Coils with Power Output Stage Refer to 3 6.17 Ignition Coils With Power Output Stage Refer to 5 3 6.17 Ignition Coils With Power Output Stage Checking". Checking". Page 1133

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0303 Cylin- der 3 Mis- fire De-	Misfire Crankshaft Speed Fluc- tuation (Sin- gle Or Multi- ple)	 Catalyst damage misfire: Catalyst damaging misfire rate > 4.72 - 	speed > 550 RPM • Engine speed > 550 RPM	200 rev Continuous	• 2 DCY	Check the spark plugs visually for signs of fouling.
tected	. ,		Engine speed < 6,848 RPM	• Contin-		Check the intake system visually for leaks (false air).
	in the standard of the standar	Emission threshold mis- fire rate (MR) > 2.25 %	 Engine load > 6.54 - 43.0% Depending on ECT @ cylinder block @ start 	uous	iddility with respect to the correctness of information in this co.	 Check for an engine me- chanical fault with a cylin- der compres- sion test.
in part or in we			 ECT @ cylinder block @ engine start <= -48° C Then activation if 		pect to the corre	Carbon buildup may cause a high- er than nor- mal com-
ial purposes,			 ECT @ cylinder block >= 20° C ECT @ cylinder 		ectness of inf	pression reading and may contrib- ute to this
	ate of commen		block @ engine start > -48° C • Fuel cut off not active		ormation in this	concern. Re- fer to appro- priate repair manual for low com-
	May Of Olisador	146.	Single fuel cut off not active Number of fade	Merit Copyright	3	pression readings or for carbon buildup re- moval.
		Protected by copyright.	out cylinders < 2.0 [-] • Dynamic manifold air pressure not calibrated kPa	lam		- Check the fuel pressure and delivery quantity. Refer to fuel
			Dynamic throttle position not cali- brated ° TPS/s			system me- chanical test- ing in ⇒ "3.1 Pre- liminary
			 Dynamic of engine load not calibrated % Engine not cali- 			Check". page 13 and/ or to appro- priate repair
			bratedEngine speed not calibrated RPM			manual. - Check the Fuel Injec-
			Dynamic of ignition angle @ idle speed not calibrated ° CRK			tors . Refer to ⇒ "3.6.14 Fuel Injec- tors , Check- ing",
			Dynamic of ignition angle not calibrated ° CRK			page 1127 . - Check the Ignition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Emission threshold misfire within 4,000 rev: Emission threshold misfire rate (MR) > 2.40 %	Rough road not detected	• 4 x 1,000 rev • Contin- uous		with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage , Checking", page 1133 .
Athinate of commercial purposes, III part or in whole, is not commercial purposes, III part or in whole, is not commercial purposes, III part or in whole, is not commercial purposes, III part or in whole, is not commercial purposes, III part or in whole, is not commercial purposes.	s authorised by Voll	_{ssw} agen AG. Volkswage	an AG does not guarantee or acq	tany liability with respect to the correctness of information in this oracle.		
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cylin- der 4 Mis- fire De-	Misfire Crankshaft Speed Fluc- tuation (Sin- gle Or Multi- ple)	 Catalyst damage misfire: Catalyst damaging misfire rate > 4.72 - 20.83 % 	speed > 550 RPM • Engine speed > 550 RPM	200 rev Continuous		Check the spark plugs visually for signs of fouling.
tected	eu l		 Emission threshold misfire within 1,000 rev: Emission threshold misfire rate (MR) > 2.25 % ECT @ cylinde block @ engine start <= -48° C Time after engine start not calibrated s Engine load > 6.54 - 43.0% Depending on ECT @ cylinde block @ engine start <= -48° C Then activation ECT @ cylinde block @ engine start <= -48° C Then activation 		• Continuous	take system visually for leaks (false air). - Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this
		or commercial P	block @ engine start > -48° C Fuel cut off not active Single fuel cut off not active Number of fade out cylinders < 2.0 [-]		a Kajub	concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal.
			 Dynamic manifold air pressure not calibrated kPa Dynamic throttle position not calibrated ° TPS/s Dynamic of engine load not calibrated % Engine not cali- 	16.	пру у откамадел	fer to fuel system me- chanical test- ing in ⇒ "3.1 Pre- liminary Check", page 13 and/ or to appro- priate repair
			 Engine speed not calibrated RPM Dynamic of ignition angle @ idle speed not calibrated ° CRK 			manual. - Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking".
			Dynamic of igni- tion angle not calibrated ° CRK			page 1127 .Check the Ignition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Emission threshold mis- fire within 4,000 rev:	Rough road not detected	• 4 x 1,000 rev		with Power Output Stage . Refer to
		Emission threshold mis- fire rate (MR) > 2.40 %		• Continuous		⇒ "3.6.17 Ig- nition Coils With Power Output Stage , Checking", page 1133
			rnoised by Volkswagen AG. V	olkswagen AG	loes not guarantee	
		So o o o o o o o o o o o o o o o o o o				**CCOT RADIES
		orin whole, is _{no}				withrespecttot
		rposes, in part	Pinorised by Volkswagen AG. V			he correctness
		sr commercial pu				of information in
		J. J. J. J. G. J. G. J. G. J. G. G. J. G.				Jan Gar
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			9	, / 4	3. Diagi	nosis and Testing 6

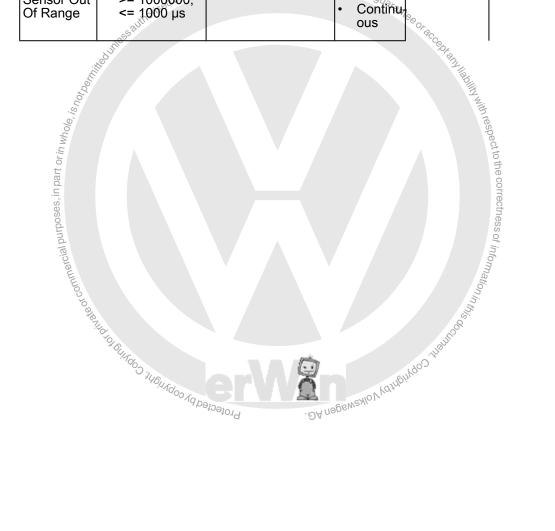
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame ^y ters with Enable Conditions	Monitoring Time Length	MIL Illumina-	agnostic Proce- dure
	Knock Sensor (KS) Rationality Check Low	For time > 3.0 s 3.0 s Difference between knock sensor signal and average knock sensor signal < 0.0 – 0.12 V Difference between knock sensor signal < 0.0 –	ECT @ cylinder block > 60° C Air mass > 229.0 mg/stk	• 4.3 s • Continuous	• 2 DCY	Check the Knock Sensor 1 - G61- Refer to 3.6.21 Knock Sensor 1 G61 Checking", page 1141.
	Knock Sensor (KS) Out Of Range	• Sensor signal < 0.12 - 0.31 V	ECT @ cylinder block > 60° C Air mass > 229.0 mg/stk Engine speed > 2,016 RPM	• 4.0 s • Continuous	· 2 DCY	- Check the Knock Sen- sor 1 - G61

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
shaft Posi-	Crankshaft Position (CKP) Sen- sor Activity Check	 Case 1: Counted exhaust camshaft signals without synchronization >= n.a. [-] Counted intake camshaft signals without synchronization n.a. [-] Case 2: Counted exhaust camshaft signals without synchronization >= n.a. [-] Counted intake camshaft signals without synchronization >= 17.0 [-] 	 Signal edges @ selected camshaft signal detected Choice of: Ignition off Engine speed > 380 RPM Engine stalling >= 1.0 s Synchronization test incorrect Engine speed >= 380 RPM Engine stalling >= 5.0 s Backwards rotation not detected Engine speed >= 400 RPM Engine stop active 			- Check the Engine Speed Sensor - G28 - Refer to ⇒ "3.6.11 Engine Speed Sensor G28 - Checking". Dage 1121 Check the Camshaft Position Sensor - G40 - Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 - Checking", page 1107 .
	Crankshaft Position (CKP) Sen- sor CPDD - Crankshaft Position Out Of Range	 Pulse width backwards < 62; > 150 µs For number of pulse widths outside tolerance > 1.0 [-] Pulse width forwards < 15; > 62 µs For number of pulse widths outside tolerance > 1.0 [-] 	• Engine speed > 0.0; <= 3,000 RPM	• 1,800.0° CRK • Continuous	DA negsweallo V _{to}	Sensor G40, Checking", page 1107.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
scrip- tion P0336 Crank	Crankshaft Position (CKP) Sensor Rationality Check	• Crankshaft reference gap not detected	Conditions General conditions: Reference gap of relucter wheel detected And Case 1: Ignition off Engine speed > 380 rpm Engine stalling >= 1.0 kg. Volkswage Or Case 2: Eengine speed >= 380 rpm Or Engine running And Engine stalling >= 5.0 s Or Case 3: Backwards rotation not detected Or	• 2,160.0° CRK • Continuous	• 2 DCY	- Check the Engine Speed Sensor - G28- Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121 . - Check the Camshaft Position Sensor - G40- Refer to ⇒ "3.6.4 Camshaft Position Sensor G40. Checking", page 1107 . Checking", page 1107 .
		E O TO THOUSE TH	• Engine stopped	DA nagsweylov	MINDINGO TREMINO	

	DTC / De- scrip- tion	Moniton Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Š	itiolinies	Crankshaft Position (CKP) Sensor Rationality Check	• Counted teeth vs. reference >= 1 <= 2	tions:	• 1,800.0°		
is not be		sor Ration- ality Check	[-]	020 Ipiii	• Contin-		
/ho/e,				• And	respe		
or in w				• Case 1:	ct to t		
part (Ignition off	hecc		
ses, in				• Engine speed > 380 rpm	orrectne		
al purpo				Engine stalling >= 1.0 s	th respect to the correctness of information in this c		
nerci				• Or	forma		
Com				• Case 2:	tionii		
0	ALL STATE			• Engine speed >= 380 rpm	~		
	10/04/1			 Or Engine running And ranger 			
	,00	246		Engine running			
		A COPALIE		(CXI/O1)			
			Prote	engine stalling >= 5.0 s			
				• Or			
				• Case 3:			
				 Backwards rotation not detected 			
				• Or			
				• Case 4:			
				• Engine speed >= 400 rpm			
				 Engine stopped 			
		Crankshaft Position	• Case 1:	• Engine speed >=	• 45,720.0 CRK)°	
		(CKP) Sen-	• Engine speed > 3000 rpm	400 rpm	Continu-		
		sor Tooth Period Ra-	Time between		ous		
		tionality Check	falling signal edges 0 – 50				
			μs • Case 2:				
			• Engine speed <= 3000 rpm				
			• Time between signal edges < 30 μs				

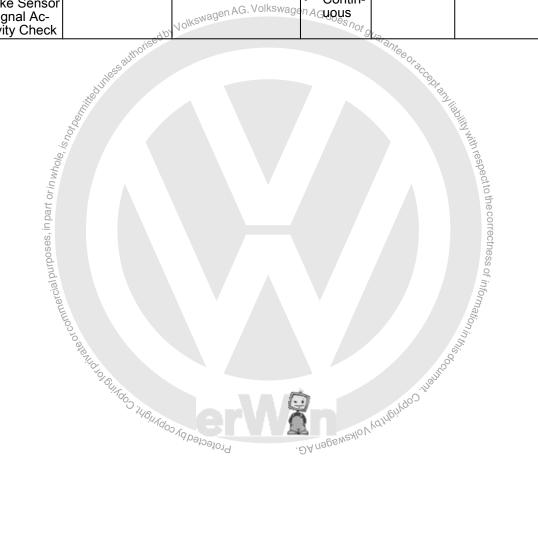
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value		Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Crankshaft Position Sensor Out Of Range	• Counted teeth vs. reference >= 1000000; <= 1,000 µs	• Engine running _{AG}	• 3600.00 • CRK • Continuous • continuous		



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Crankshaft Position Sensor Out Of Range	• Segment adaptation >= 0.70 %	 Fuel cut off active Delay time >= 5760.00° CRK 	• 180.00 [°CRK]		
	· ·		• And			
			Diff. actual air mass vs. previ- ous air mass <= 20.01 – 39.99 mg/stk			
			• Engine load <= 20.00 %			
		_w agen AG. Volkswagen	Dynamic throttle position <= 269.50 – 398.40° TPS/s			
	. 10///6	wagen AG. Volkswagen	Rough road not detected AG does on the detected AG does on the detected detec			
	authorised by Vo.		Engine rough- ness signal not valid			
A Miller See See See See See See See See See S			Segments in fuel cut-off mode >= 32.00 [-]	* an liab;		
i, isnota			Segment adaptation finished	III) WITH I		
Whole			• Engine speed 2,016 – 5,024 rpm	aspect to th		
			6 cylinder engine:	e corr		
rolalpur			Diff. between adapted value of cylinder 1 and cylinder 6 not calibrated [%]	ectness of infor		
of private or comme	O HONADO ADO		Diff. between adapted value of cylinder 4 and cylinder 2 not calibrated [%]	liability with respect to the correctness of information in this doc.		
20114	O JUGOD AG PG	G. Protect	Diff. between adapted value of cylinder 3 and cylinder 5 not calibrated [%]			
			4 cylinder engine:			
			Diff. between adapted value of cylinder 1 and cylinder 3 < 0.70 %			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Diff. between adapted value of cylinder 2 and cylinder 4 < 0.70 %	Contin- uous agen AG. Volks	wagen AG does no	*90arantee
P0340 Cam- shaft Posi- tion Sen- sor "A" Circuit Bank 1 or Single Sen- sor	Camshaft Position (CMP) In- take Sensor Signal Ac- tivity Check	No change on signal > [-] Ot commercial purposes, inpart or in whole, is not commercial purposes.	400 RPM	 2,520.0° CRK Continuous 		- Check the Camshaft Position Sensor - G40- Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 - Check the Engine Speed Sensor - G28- Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121
P0341 Cam- shaft Posi- tion Sen- sor "A" Circuit Rang e/Per- for- manc e Bank 1 or Single Sen- sor	Position (CMP) In- take Sensor Rationality Check	 Ratio between measured segment time ratio and specified camshaft angle ratio > 2.75 [-] Or Ratio between measured segment time ratio and specified camshaft angle ratio < 0.36 [-] Or Offset between camshaft and crankshaft < -79.00° CRK Or Offset between camshaft and crankshaft < -79.00° CRK Or 	• Engine speed 400 – 8160 RPM	• 990.00° CRK • Contin-	. DA nagswext	- Check the Camshaft

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Camshaft Position (CMP) In- take Sensor Out of Range	Offset be- tween cam- shaft and crankshaft < -79.0° CRK Or Offset be- tween cam- shaft and crankshaft > 15.00° CRK	 Engine synchronization not validated Failure by exhaust camshaft sensor detected 	• 450.0° CRK • Once / DCY		
	Camshaft Position (CMP) In- take Sensor Signal Ac- tivity Check	• Segment time value < 50 μs	Engine speed 400 – 8,160 RPM Volkswagen AG. Volkswagen Volkswagen AG. Volkswagen Volkswagen AG. Volkswagen Volkswagen AG. Volkswagen Volkswagen AG. Volkswagen	• Contin-	/ a.	



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P039 B Cylinder 1 Pressure Too High	Knock Control Function Check	 Slow detection: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % 	900.0° CRK Continuous	• 2 DCY	- This DTC may set due to poor fuel quality or fuel that has aged exces- sively. If nec- essary, drain the fuel from the vehicle and replace
		9,000.0 – 11,700.0° CRK • Ratio between knock sensor	 Air mass > 403.0 501.0 mg/stk Dynamic engine speed not active Delay time not calibrated seg 			with fresh fuel. - Check the spark plugs visually for
	or commercial purposes, in part or in whole, is not bey	window > 3.50 - 5.0 [-] • For time >= 5,760.0 - 6,840.0° CRK • Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] • Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] • For time >= 12,960.0 - 16,740.0° CRK • Torque limitation factor < 0.90 [-]	calibrated seg		tee of accepted liability milities of the control o	ute to this concern. Refer to appropriate repair manual for low compression readings or for carbon

• Fast detection: • Ratio between knock sensor and knock window > 1.50 - 2.50 [-] • For time >= 540.0° CRK • Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] • For time >= 360.0° CRK3 • Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] • For time >= 360.0° CRK3 • Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] • For time >= 360.0° CRK3 • Ratio between filtered engine roughness and misfire detection threshold <=	DTC De- scrip- tion	Strategy	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
360.0° CRK- Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Case 3: Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-]	emercial purposes, in part or in whole;	Millian Maria Company of the Company	 tion: Ratio between knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] 	 ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Air mass > 403.0 – 501.0 mg/stk Misfire detection active Dynamic engine speed not active Delay time not calibrated seg olkswagen AG does not guar 		with respect to the correctness of information	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable of Conditions	Monitoring Solution Length	MIL Illumina- tion	Component Diagnostic Procedure
P03A 5 Cylinder 2 Pressure Too High	Knock Control Function Check in part or in whole, is not in whole, is not in whole in the control of the contro	tion: Ratio between	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Air mass > 403.0 – 501.0 mg/stk Dynamic engine speed not active Delay time not calibrated seg 	• 900.0° CRK • Continuous	DCY Option lind in respect to a respect to	with fresh fuel.

De- S	Monitor Strategy escription	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
scrip- De	escription	 Fast detection: Ratio between knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection gen Adthreshold <= 0.41 - 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine rough-roughness and misfire detection threshold n.a. [-] Ratio between normalised engine rough-roughness and misfire detection threshold n.a. [-] 	• Engine running • ECT @ cylinder block > 60° C • Engine speed 1,216 – 6,400 RPM • Engine load n.a. % • Air mass > 403.0 – 501.0 mg/stk • Misfire detection active • Dynamic engine speed not active • Delay time not calibrated seg	Length Length Lity with respect to the correctness of information in the correctness of the correct		
146ji)	Adoo Aq pajoaj	O19 .DAn.	HEALT COPHIBITION VOIKEWAGE			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P03A F Cylinder 3 Pressure Too High	Knock Control Function Check	Slow detection: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-]	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % 	900.0° CRK Continuous	• 2 DCY	- This DTC may set due to poor fuel quality or fuel that has aged exces- sively. If nec- essary, drain the fuel from the vehicle
		• For time >= 9,000.0 - 11,700.0° CRK	 Air mass > 403.0 501.0 mg/stk Dynamic engine 			and replace with fresh fuel.
		Ratio between knock sensor and noise lev- el in pre knock window > 3.50	 speed not active Delay time not calibrated seg 			Check the spark plugs visually for signs of fouling.
		- 5.0 [-] • For time >= 5,760.0 - 6,840.0° CRK				Check for an engine mechanical fault with a cylinder compression test.
		knock sensor and noise level in pre knock window > 3.50 - 5.0 [-]	by Volkswagen AG. Volkswa	gen AG _{does no}	* guarantee or accepta	Carbon buildup may cause a high- er than nor- mal com- pression reading and
	Or 10	and knock threshold in main knock window > 2.0 - 3.0 [-]				concern. Re- fer to appro- priate repair manual for low com- pression
	vroses, in part	16,740.0° CRK • Torque limitation factor <				readings or for carbon buildup removal.
		0.90 [-]			auri	Knock Sensor 1 - G61 - Refer to "3.6.21 Knock Sensor 1 G61, Checking", page 1141 - Check the Engine Speed Sensor - G28 - Refer to "3.6.11
		11. 140.1VG	Protected by Co.	JKewagen AG.	V Walner Walnut on Jr. 17	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28,

De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
tion		el in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-]	Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Air mass > 403.0 7501.0 mg/stk Misfire detection active Dynamic engine speed not active Delay time not calibrated seg	. ĐAr	adoes not guarante	Checking", page 1121.
		[-]				

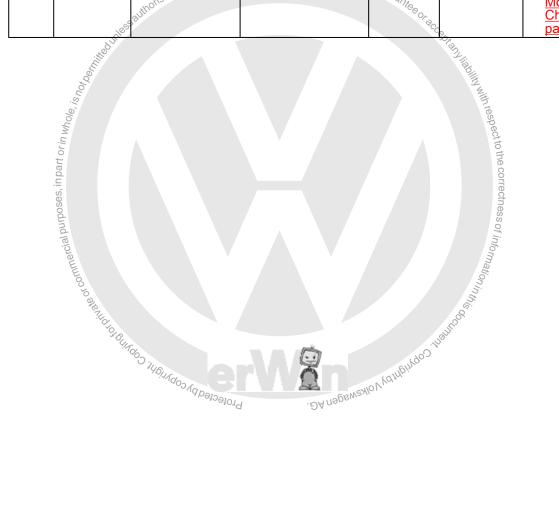
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P03B 9 Cylinder 4 Pressure Too High	Knock Control Function Check	 Slow detection Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 9,000.0 - 11,700.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] For time >= 5,760.0 - 6,840.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 12,960.0 - 16,740.0° CRK Torque limitation factor < 0.90 [-] 	 Engine running ECT @ cylinder block > 60° C Engine speed 1,216 – 6,400 RPM Engine load n.a. % Air mass > 403.0 – 501.0 mg/stk Dynamic engine speed not active Delay time not calibrated seg 	• 900.0° CRK • Continuous	• 2 DCY BENSHO NOWEN	 This DTC may set due to poor fuel quality or fuel that has aged excessively. If necessary, drain the fuel from the vehicle and replace with fresh fuel. Check the spark plugs visually for signs of fouling. Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61- Refer to ⇒ "3.6.21 Knock Sensor 1 G61. Checking", page 1141 Check the Engine Speed Sensor - G28- Refer to ⇒ "3.6.11 Engine Speed Sensor G28.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Fast detection: Ratio between knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 2: 	 Engine speed 1,216 – 6,400 RPM Engine load n.a. % Air mass > 403.0 – 501.0 mg/stk Misfire detection active Dynamic engine speed not active Delay time not calibrated seg 			Checking", page 1121.
		 Ratio between normalised engine roughness and misfire detection threshold n.a. [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold n.a. [-] Ratio between normalised engine roughness and misfire detection threshold n.a. [-] 	Sold the state of	_W agen AG. Voll	swagen AG does t	Tot 9 Uarantes Oracle Brand land
			TO BRAILE TO JE BLANCO STUDINA OUD KAPE	protection of the contraction of	· ĐA (3º D) NG.	MORANGING OF STREET

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
AIR A Sys- (, tem ti	Secondary Air Injection AIR) Func- ional Check	Diff. pressure value after secondary air injection vs. pressure value before secondary air activation > 5.0 kPa The secondary air injection vs. pressure value before secondary air activation > 5.0 kPa The secondary in the secondary air injection vs. pressure value before secondary air activation > 5.0 kPa The secondary in injection vs. pressure value before secondary air injection vs. pressure value before secondary air injection vs. pressure value before secondary air activation > 5.0 kPa The secondary injection vs. pressure value before secondary air activation > 5.0 kPa The secondary injection vs. pressure value before secondary air activation injection vs. pressure value before value vs. pressure value vs. pressure value vs. pressure vs. pr	 General: AIR pump ready Catalyst heating active AIR finished MAF <= 140.0 kg/h ECT @ cylinder block >= -10 center block >= -10; MAT @ manifold >= -10; Modeled catalyst temperature < 700° C Relative barometric pressure > 0.73 - Diff. BARO vs. MAP n.a. kPa Engine n.a. 			- Check the Secondary Air Injection Sensor 1 - G609 - Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609 - Checking", page 1159 - Check the Secondary Air Injection Pump Relay - J299 - / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101 - Checking", page 1157 - Check the Secondary Air Injection Solenoid Valve N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112 - Checking", page 1163 - Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 Refer to ⇒ "6.32 Secondary Air System GX24 Refer to ⇒ "6.42 Refer to ⇒ "6.43 Refer to ⇒ "6.44 Refer

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
P0413 AIR System Switc hing Valve "A" Circuit Open		Output voltage, lower range >= 1.92 - 2.21 V Output voltage, upper range <= 2.85 V Output voltage, upper range <= 2.85 V	Actuator commanded off	• 0.5 s • Continuous	et guarantee or accept	- Check the Secondary Air Injection Solenoid Valve - N112 - Refer to "3.6.31 Secondary Air Injection Solenoid Valve N112 Checking", page 1163 . - Check the Secondary Air System - GX24 - Refer to ⇒ "3.6.32 Secondary Air System GX24 . Checking", page 1165 .
P0414 AIR Sys- tem Switc hing Valve "A" Circuit Shor- ted	Secondary Air Injection (AIR) Valve Short To Ground Secondary Air Injection (AIR) Valve Short To Battery Plus	• Output voit-	Engine running Actuator commanded off Engine running Actuator commanded on	• 0.5 s Continuous	· 2 DCY their	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0418 AIR Sys- tem Con- trol "A" Circuit		Output voltage, upper range (hardware values) <= 2.85 - 3.25 V	Engine running Actuator commanded off AG. Volkswagen AG does not be a second to be a s	0.5 s Continuous Of guarantee or accommendations Of guarantee or accommendation or accom	• 2 DCY	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	NMOG / NMHC / NOX Con- version Ca-	Arithmetic average Catalyst efficiency not calibrated [-] EWMA filtered Catalyst efficiency not calibrated [-] Arithmetic average, corrected with measured delay and transition time of	 General conditions: Vehicle speed >= 10 km/h BARO not calibrated kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S heater rear 	• 86.5 s • Once / DCY	• 2 DCY	- Check the Three Way Catalytic Converter (TWC). Refer to 3.6.33 Thre e Way Catalytic Converter, TWC Checking", page 1168. - Check the Oxygen Sensor 1 After Catalytic
		oxygen sensors rear • Catalyst efficiency > 1.0]-] • EWMA filtered, corrected with measured delay and transition time of was oxygen sensors rear • Catalyst efficiency not calibrated [-]	ance O2S rear <= 700.0 Ω Time after a catalyst purge phase To 0.02 s AG does Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s		pect to the correctness of information in this odourn	Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149 . - Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Coasting function not active			
			Lambda adapta- tion not active			
			Valve lift not equipped swagen AG	i.Volkswagen A	G does not gue	
			Temperature Conditions:		darani	***Or
		iko dililo	• ~~ Signal (tmot) > 60° C			Cept and I
		Shotbern	• ~~ Signal (tans) > -48° C			ability Witi
		t orin whole, is	Modeled catalyst temperature once after engine start > 550° C			n respect to th
		rposes, in par	Modeled catalyst temperature @ start of diagnosis 500 – 700° C			e correctness
		or commercial purposes, in part or in whole, is not be milling to the commercial purposes, in part or in whole, is not be milling to the commercial part of the	Modeled catalyst temperature dur- ing diagnosis 470 – 730° C			of information
		So of the state of	Integrated air mass, catalyst temperature con- ditions fulfilled not calibrated g			in the state of th
			ters with Enable Conditions Coasting function not active Lambda adaptation not active Valve lift not equipped Conditions: Temperature conditions: "Signal (tans) > -48° C Modeled catalyst temperature once after engine start > 550° C Modeled catalyst temperature @ start of diagnosis 500 – 700° C Modeled catalyst temperature during diagnosis 470 – 730° C Integrated air mass, catalyst temperature conditions fulfilled not calibrated g Diff between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 – 254.0 K	.ea.	и при Локем в ден	hado"
			Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K			
			Modeled EGT @ O2S rear <= 1,201° C			
			Air mass conditions:			
			Air mass @ start of diagnosis 125.01 – 580.0 mg/stk			
			Air mass during diagnosis not calibrated mg/stk			

		nsed by Volkswa	gen AG. Volkswagen AG doe	Snor Generic S	Jetta/Bo Scan Tool - Ed	eetle 2013 ➤ (ition 12.2017
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina-	Component Diagnostic Procedure
	whole, is not be		 MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated % Low dynamic conditions of the conditions o		aty with respec	
	part orin _v		MAF per cylinder during diagnosis 35.0 – 135.0 kg/h		ct to the cor	
	ses, ir		Load conditions:		rectn	
	cial purpos		Air mass set point 125.01 – 580.0 mg/stk		ess of info	
	or commer		Engine load not calibrated %		rmationin	
	Stanily 104		 Accelerator pedal value not calibra- ted % 		OUTO SIL	
		CHADINGOO THEINGOO	For time not calibrated s	VOMBINGO	, V	
		ologioe!	ord conditions DA nagen	110 _{lK2}		
			Dynamic engine speed < 20 RPM			
			Dynamic air mass < 25.01 mg/ stk			
			Dynamic lambda controller output < 20.0%			
			Integrated air mass after dy- namic conditions are fulfilled > 20.0 g			
			Evap purge con- ditions: Case 1			
			Evap purge valve not calibrated			
			• Case 2			
			Canister load cal- culation not cali- brated			
			Evap purge flow not calibrated			
			• Case 3			
			Canister load not calibrated [-]			
			Evap purge flow not calibrated			
			Close the gap conditions:			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Time Length	MIL Illumina- tion	agnostic Proce- dure
	illo diffice	50	 O2S rear voltage @ diagnosis start >= 0.55 V 	90	Sept and live	
	hole, is hot bern	Taby Tubilly doo ya babalo y	 Integrated air mass @ start di- agnosis not cali- brated g 		idditty with respect to the correctness of information in this occurrence of the correctness of the correctne	
	part or in w		 O2S front dynamic diagnosis separate not active 		scttotheco	
	urposes, in		 For arithmetic average value calculation: 		rrectness c	
	r commercial P	V	 Number of checks required for valid result >= 2.0 [-] 		nf information j	
	OBEN		• For EWMA-filter:		"This of	
	"to to to to	1000 illi	 Minimum number of tests per DCY required not cali- brated 	Copyrigi	Egilligo	
		Totected by copyrie	 Step change de- tection will initiate multiple tests per DCY 	10V KOJIN,		
			 Conditions for step change de- tection: 			
			 Relative deviation between new measured value and old EWMA fil- tered value not calibrated [-] 			
			 Number of checks not cali- brated [-] 			

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Sys- tem Leak De-	Evaporative Emission (EVAP) System Out Of Range High	current during reference measurement > 40.0 mA	 Barometric pressure > 73.0 kPa AAT 4 – 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not 	• 624.0 s • Once / DCY	• 2 DCY	- Check the Leak Detec- tion Pump - V144 Refer to ⇒ "3.6.22 Leak Detec- tion Pump V144, Checking", page 1143 .
art orin whole, is not bern	Bods and The State of the State	monse	Evap pump current during reference measurement < 15.0 mA	 calibrated K Propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) Airbag not activated 	A liability with respect to the	0.700	
ove of commercial purposes, in page	High Flow	Evaporative Emission (EVAP) System Out Of Range Low		 Barometric pressure > 73.0 kPa AAT 4 – 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s Engine stop (during ECM keep 	• 624 Once of information in this co.	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
				alive-time) • Airbag not activated			

Evaperative Ratio actual nicor System C(VAP) Canister Concert Concert	DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
• O2S front 0.95 – 1.05 [-]	P0441 Evaporative EVAP System Incorrect Purge Flow Check:	intake mani- fold pressure and modeled set point in- take manifold pressure < 0.05 [-]	block > 58° C BARO > 73.0 kPa AAT > 5° C AAT @ start >= 5° C Diff. BARO vs. filtered MAP >= 33.0 kPa Diff. BARO vs. filtered MAP > 33.0 - 40.0 kPa Engine speed < 2,200 RPM ratio MAF @ Volk manifold and MAF max > 0.070.09 [-] Engine speed < 1,180 RPM Coasting function not calibrated Vehicle speed >= 5 km/h Diff. engine speed < 90 RPM Diff. ratio MAF @ manifold and MAF max vs. ratio filtered MAF @ manifold and MAF max vs. ratio filtered MAF @ manifold and MAF max < 0.15 [-] Diff. modeled MAP < 1.50 kPa Integrated air mass since engine start >= 0.0 - 5,000.0 g Integrated acontrol active Lambda control active Lambda control value -30.0 - 30.0% O2S front 0.95 -	• Once / DCY	s not guarantee or act	EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 . - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Fuel cut off not calibrated			
			• Case 1:			
			 Integrated air mass @ canister purge valve per driving cycle not calibrated g 			
			• Case 2:			
		Sunless authorised by Volksw	driving cycle not calibrated g Case 2: Ratio MAF @ and MAF per cylinder not calibrated [-] Canister purge sampling rate >= 40.0% Integrated air mass @ canister purge valve >= 2.1 g Depending on AAT:	Des not guarantee	0,	
		Suniesesd	 Canister purge sampling rate >= 40.0% 		acceptany line	
	hole, is not ber		 Integrated air mass @ canister purge valve >= 2.1 g 		oliki with respe	
	t orin w		 Depending on AAT: 		0.00	*
	in pa		• AAT >= 20° C			o o o o o o o o o o o o o o o o o o o
	rposes,		• Canister load <= 0.17 [-]			
	ial pu		• Or		or Infi	
	ommerc		• AAT >= 30; < 20° C		ormation	
	Nateorc		• Canister load <= 0.17 [-]		Tin this oc	
	, o	0,0,	• AAT < 30° C		igunoc	
		AND SABINADOS	• Canister load <= 0.17 [-]	KAMBIN	The information in this occurrence is a second of the information in this occurrence is a second of the information in the info	
		ofed by	Prote	NOIKEMS		

	162			C.Co.		
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0442 EVAP Sys- tem Leak De- tected (Small Leak)		pump current vs. rough leak reference cur- rent < 0.0 mA • And	 Barometric pressure > 73.0 kPa AAT 4 – 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) 	• 624.0 s	2 DCY 2 pect to the correctness of Information	- Check the EVAP System for Leaks. Refer to ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6 - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80 Checking", page 1123
						- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .
P0444 EVAP Sys- tem Purge Con- trol Valve "A" Circuit Open	Emission (EVAP) Canister	 Output voltage lower range >= 1.92 - 2.21 V Output voltage upper range (hardware values) <= 2.85 - 3.25 V 	 Engine start not active Engine running Evap purge valve opening signal (PWM) > 3.13; <= 98.83% Actuator commanded off 	• 2.0 s • Continuous	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 . - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
EVAP Sys- tem	f Oct milities	Output voltage (hard-ware values) 1.92 – 2.21 V 1.92 – 2.21 V Actuator temperature > 160 – 200° C Or Output current > 4.0 – 7.0 A	 Actuator commanded off Engine start not active Engine running Evap purge valve 		cod tany liability with respect to the correctness	- Check the EVAP Canister Purge Regulator Valve 1 - N80- Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 .
P0447 EVAP Sys- tem Vent Con- trol Circuit Open	d	age lower range 1.85 – 2.28 V Output voltage upper range (hardware values) 2.75 – 3.36 V	Actuator commanded off	• Continuous	• 2 DO Information in this oboling	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
EVAP Sys- tem Vent Con- trol	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Ground	age (hard- ware values) < 1.85 – 2.28 V	• Actuator com- oud manded off∀ uaben	• Continuous	• 2 DCY	 Check the Leak Detection Pump - V144 Referto ⇒ "3.6.22 Leak Detection
Circuit Shor- ted	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Battery Plus	perature > 155 - 185° C • Or	Actuator com- manded on			tion Pump V144 , Checking", page 1143 .

De- \$	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
EVAP Er Sys- (E tem Sy Leak Ve De- Le tected tio	vaporative imission EVAP) ystem ery Small eak Ra-onality check	pump current vs. small leak reference cur- rent < 0.0 mA And Pump current measurement time > 600.0 s And Pump current gradient >= 0.30; <= 0.01 mA/s Pump current gradient < 0.002 mA/s Difference pump current vs. small leak reference cur- rent >= 0.0 mA And Pump current gradient < 0.002 mA/s And Ratio between actual pump current and small leak ref- erence pump current < 1.10 [-]	gine start in preceding dcy >= 600.0 s • Difference between ECT and AAT @ start not		swagen AG does n	- Check the EVAP System for Leaks. Refer to ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143 .

DTC / Monitor Strategy scription Description Old Value Secondary Parameters with Enable Conditions Monitoring Time Length	tion agnostic Proce-
PO491 Secondary Air Injection System Insufficient Flow Bank 1 1 - Case 1: - 1.8L Block- age: Ratio relative measured secondary air pressure and modeled secondary air pressure and modeled secondary air pressure lube blocked] < 0.65 [-] - 0.6	- Check the Secondary Air Injection Sensor 1 - G609 Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609. Checking". page: 1159. - Check the Secondary Air Injection Pump Relay J299-/ Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101. Checking". page 1157. - Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve - N112. Checking". page 1163. - Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		• Leakage: Ratio relative measured secondary air pressure and modeled secondary air pressure [leak diagnosis] < 0.03 [-]	dbyVolkswagen Ad. Volkow	udes n	of guarantee or accept	and liability with res
P0501 Vehicle Speed Sensor "A" Circuit Rang e/Perfor- manc e	cle Speed Sensor (VSS) Com- munication With VSS	Speed sensor fault value: out of range high failure Speed sensor fault value: out of range low failure Speed sensor fault value: rationality check high failure Speed sensor fault value: rationality check low failure	Protected by Copy	• 0.5 s • Continuous	• 2 DCY • 2 DCY • 2 DCY	- Check the vehicle speed signal. Refer to ⇒ "3.6.36 Vehicle Speed Signal. Checking", page 1174 Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
P0502 Vehicle Speed Sensor "A" Circuit Low	Vehicle Speed Sen- sor (VSS) Short To Ground Vehicle Speed Sen- sor (VSS) Open Cir- cuit Vehicle Speed Sen- sor (VSS) Short To Battery Plus	Diagnostic signal from output driver failure	J	• 0.5 s • Continuous	• 2 DCY	 Check the vehicle speed signal. Refer to ⇒ "3.6.36 Vehicle Speed Signal. Checking", page 1174. Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Di- agnostic Proce- dure
P0506 Idle	Idle Speed Control	Diff. actual engine speed vs.	 General conditions: 	• 10.0 s	• 2 DCY	 Check the Throttle
Con- trol Sys-	(ISC) Function Monitoring: En-	engine speed set point < -100 RPM	 Vehicle speed = 0 km/h 	Continuous		Valve Con- trol Module - GX3 Refer
tem RPM - Lower Than	gine Speed Deviation	Integrated I- part of idle speed control-	 Accelerator pedal released by driv- er 			to <u>⇒ "3.6.34</u> <u>Throttle</u> Valve Con-
Ex- pec-		ler n.a.	Throttle actuator commanded on			trol Module GX3, Check-
ted			 Evap purge flow < 8.0 kg/h 			<u>ing",</u> page 1169 .
			Engine running			
			 Time after engine start not calibra- ted s 			
			• Clutch switch n.a.			
			Barometric pres- sure > 70.0 kPa			
		wagen AG. Vol	Catalyst heating kswanot active			
	"horise	9ph Nolksmas	ECT @ cylinder block > -48° C and block Colored and colored	* ©0		
	dunless auti		Set point change n.a. RPM	ee or accept any liebility		
4	Mill of the state		For time n.a. s	NA III		
3, is notbe		aby Volkswagen AG. Vol	 Additional after dynamic condi- tions fulfilled: 		Withre	
rin whole			Gear switch not active		Nith respect to	
oart o			• (A/T only)		theco	
rposes, in l			 Accelerator pedal released by driv- er 		to the correctness of information	
ercial pu			 Vehicle speed 0 km/h 		of inforn	
COMM			• Engine load < 30.47%		nation :	
,	A DALLA		• (M/T only)	This		
	O TO		For time not cali- brated s	indo itempologia		
	1461,1,	Jagoo Va Deloelo Jagoo Ind	.DAnagsweyloVvdrhp	in		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0507 Idle		Diff. actual engine speed vs.	General conditions:	• 10.0 s	• 2 DCY	Check the Throttle
Con- trol Sys-	(ISC) Func- tion Moni- toring: En-	engine speed set point > 100 RPM	 Vehicle speed = 0 km/h 	Continuous		Valve Con- trol Module - GX3 Refer
tem RPM - High-	gine Speed Deviation	Integrated I- part of idle speed control-	 Accelerator pedal released by driv- er 			to ⇒ "3.6.34 <u>Throttle</u>
er Than Ex- pec-		ler n.a.	Throttle actuator commanded on			Valve Con- trol Module GX3, Check-
ted			 Evap purge flow < 8.0 kg/h 			<u>ing",</u> page 1169 .
			Engine running			
			 Engine running Time after engine start not calibrated s Clutch switch n.a. Barometric pressure > 70.0 kPa Catalyst heating not active ECT @ cylinder block > -48° C Set point change < n.a. RPM For time n.a. s And Additional after dynamic conditions fulfilled: Gear switch not active (A/T only) Accelerator pedal released by driver Vehicle speed 0 km/h For time not calibrated s 			
			Clutch switch n.a. AG Volkswager			
		ised by	• Barometric pres- sure > 70.0 kPa	AG does not gu	Ran.	
		nless authorite	 Catalyst heating not active 		"Mee or docer	
		William Control	 ECT @ cylinder block > -48° C 		N _{ent} ligh	۵.
	ish	d to	 Set point change < n.a. RPM 			HAWITH T
	Whole		For time n.a. s			espec
	torin		• And			At to th
	es, inpar		Additional after dynamic condi- tions fulfilled:			e correctr
	sodind		Gear switch not active			ness of i
	nercia		• (A/T only)			nform
		10 015	 Accelerator pedal released by driv- er 		"//5	ationing
		JII O O O O O O O O O O O O O O O O O O	 Vehicle speed 0 km/h 		inshirod	
		So Standard Buildon Mandon Mandon	For time not calibrated s	MAN	Milhingon	
			G. Protected h.	Anspsway		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P050 A Cold	Cold Start Monitoring Idle Speed	Diff. actual en- gine speed vs. engine speed	General conditions:Vehicle speed = 0	10.0 sContinuous	• 2 DCY	Check the Throttle Valve Con-
Start Idle Con-	Control (ISC) Func- tion Moni-	set point > 200 RPM	km/hAccelerator pedal	uous		trol Module - GX3 Refer to
trol Sys- tem	toring: En- gine Speed Deviation	Integrated I- part of idle speed control-	released by driv- er			<u>⇒ "3.6.34</u> Throttle Valve Con-
Per- for- manc		iei n.a. Volkswage	Throttle actuator AGCommanded on	00¢ .		trol Module GX3, Check- ing",
е		s authorised by .	 Evap purge flow < 8.0 kg/h Engine running 	Pot guarantee or ac		page 1169 .
	Allille	Þ	Engine runningTime after engine	**	C _C O _F	
	of pormitte	part of idle speed controller n.a.	start not calibra- ted s		ced and liability with respect to the correctness of information in this cook, and liability with respect to the correctness of information in this cook, and liability with the correctness of information in this cook, and the correctness of	
	s, isn		• Clutch switch n.a.		With To	
	r in whole		 Barometric pres- sure > 70.0 kPa 		spectto	
	inpart o		Catalyst heating active		the corn	
	rposes,		ECT @ cylinder block > -10° C		ectness	
	ercial pu		Set point change n.a. RPM		of inform	
	SOMIN		For time n.a. sAdditional after		Pation	
	No alegand		dynamic conditions fulfilled:		in this obgo	
	40100		 For time n.a. 		lant.	
		Aco Adbeloelo	Gear switch not active	10 V VOIMBINGOD.		
		NO TO	• (A/T only)	1101		
			 Accelerator pedal released by driv- er 			
			 Vehicle speed 0 km/h 			
			 For time not cali- brated s 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
		Diff. actual engine speed vs.	General conditions:				
		engine speed set point < -100 RPM	• Vehicle speed = 0 km/h				
		Integrated I- part of idle speed control-	Accelerator pedal released by driv- er				
		ler n.a.	Throttle actuator commanded on				
			• Evap purge flow < 8.0 kg/h				
			Engine running				
			Time after engine start not calibra- ted s				
			Clutch switch n.a.				
			Barometric pres- sure > 70.0 kPa				
			Catalyst heating active				
			ECT @ cylinder block > -10° C				
			Set point change n.a. RPM	Volks	_W agen AG. Volksv	ragen AG does not a	
			For time n.a. s	thorisedby		9U _{ar}	antee
			Additional after dynamic conditions fulfilled:				Oraccept any
			Gear switch not active				lab.
			• (A/T only)				
			Accelerator pedal released by driv- er				
			• Vehicle speed 0 km/h				
			• Engine load < 30.42%				
			• (M/T enly)		V A		
			For time not cali- brated s				5.5
	•		S _{IIQ} to Ringle	D THOUNDOON A PE	BIM Biologia	BA nagsweshlo V vor	Heingo jingingo s

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
De- scrip-	Strategy	Difference between commanded ignition timing efficiency vs. actual value > 20.0% Difference between commanded ignition timing efficiency vs. actual value > 20.0% Difference between commanded ignition timing efficiency vs. actual value > 20.0%	 ters with Enable Conditions Engine idle speed Ignition angle efficiency setpoint <= 0.80 [-] Modeled pressure quotient <= 1.00 [-] Barometric pressure > 73.00 kPa Catalyst heating active Engine start temperature 5 - 45° C Time after engine start > 2.0 s Vehicle speed 0 km/h And Diff. air mass setpoint for load dynamic detection not calibrated [mg/stk] For time not calibrated [s] And Diff. engine speed for engine speed dynamic speed dynamic speed dynamic speed dynamic speed dynamic speed dynamic speed speed for engine speed dynamic speed dynamic speed dynamic speed dynamic speed dynamic speed sp	Time Length • 6.0 s • Once / DCY	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control
			namic detection not calibrated [rpm] post calibrated [rpm] provided [rpm] provided [rpm]	AAG.	өр <i>ы</i> мгу/о√үд/үр/ү	80-3

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Position Timing Over- Advance d Bank 1			Modeled oil temperature -40 – 160° C Engine speed 608 – 6,016 RPM Camshaft position not calibrated Camshaft position adjustment active Catalyst heating active Camshaft position deviation integrator (actual vs. setpoint position) >= 9.0° CRK*s Cansaltation in the complete of	_{kewagen} AG. V	olkswagen AG doe.	N205, Checking", page 1105,
P053 F Cold Start Fuel Pres- sure Per- for- manc e Bank 2	Cold Start Monitoring Fuel Sys- tem Out Of Range Low	Deviation be- tween set point and ac- tual fuel pres- sure > 1,500.2 kPa For time >= 3.0 s	 General: Engine speed > 608 RPM Time after engine start > 3.0 s Fuel mass set point lower range > 1.99 mg/stk For time >= 5.0 s 	• 5.0 s • Once / DCY	• SA negsw	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
those.	Cold Start Monitoring Fuel Sys- tem Out Of Range High	Deviation be- tween set point and ac- tual fuel pres- sure < -1,500.2 kPa For time >= 3.0 s orieed by Nolkswagen AG	 Fuel mass set point upper range <= 100.32 – 172.41 mg/stk Fuel mass set point gradient -1,389.0 – 2.2 mg/stk For time >= 1.2 s Additional for cativallyst heating: Catalyst heating: ECT @ cylinder block > -48° C Fuel mass set point lower range >= 5.0 mg/stk For time >= 3.0 s Time after engine 	arantee or acceptal	, liability with respe	- Check the Fuel Pressure Sensor - G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 . Checking", page 1131 . - Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 . Checking", page 1129 .
Start Turse bood charger/Surson per- charger	Turbo- charger (TC) Boost Pressure Control Valve Cold Start Func- tional Check - Slow Re- sponse	 Boost pressure actuator position controller output > 98.0% Boost pressure actuator position controller output < -98.0% 	 Time after engine start >= 4.0 s ECT > -10° C AAT > -10° C Catalyst heating active Boost pressure control active 	• 0.4 s • Continuous	• 2 D the correctness of information in this on	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113
Boost Con- trol "A" Per- for- manc e	Turbo- charger (TC) Boost Pressure Control Valve Cold Start Func- tional Check	Deviation boost pressure actuator position controller > 16.0 – 100.0% Application properties of the properties	 Time after engine start >= 4.0 s ECT > -10° C AAT > -10° C Difference be tween actuator position set point in normal mode and during catalyst heating > 0.0% Catalyst heating active Boost pressure control active 	O. H. G. W. G. O. C. L. G. L. L. G. L.		- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 Checking", page 1172 - Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8
						⇒ 3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Grille Air	Active Grille Air Shutter Functional Check	Blocked active grille air shutter detected	AAT not calibra- ted ° C	• 0.3 s • Continuous	• 2 DCY	 Check the Radiator Shutter Mo- tor - V544 Refer to
Shut- ter "A" Stuck On		Uncontrolled adjustment detected	- O Malko			⇒ "3.6.27 Radiator Shutter Mo- tor V544, Checking", page 1155.
P05A 2 Active Grille Air Shut- ter "A" Con- trol Cir- cuit/ Open	Active Grille Air Shutter Open Cir- cuit	upper range < 2.85 3.25 V	_{ge} d by Volkswagen A.G. Volks		• 2 DCY not guarantee oracce	- Check the Radiator Shutter Motor - V544- Refer to ⇒ "3.6.27 Radiator Shutter Motor V544 Checking", page 1155
Grille Air Shut- ter "A" Con- trol	Active Grille Air Shutter Functional Check	Internal logic failure detected Initialisation failure detected Initialisation failure detected		0.3 sContinuous0.0 sContinuous	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544- "
Circuit Rang e/Per- for- manc e	Active Grille Air Shutter Activity Check	Active grille air shutter controller feedback sig- nal failed		• 24.0 s • Continuous	į	Checking", page 1155 .
P05A 4 Active Grille Air Shut- ter "A" Con- trol Circuit High	Active Grille Air Shutter Short To Battery Plus	 Power stage temperature > 160.0 - 200.0° C Or Signal current > 4.0 - 7.0 A 	Protected by copyright	. DA nagswa	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544, Checking", page 1155 .
P05A 5 Active Grille Air Shut- ter "A" Con- trol Circuit Low	Active Grille Air Shutter Short To Ground	• Signal voltage < 1.92 – 2.21 V	 Recording time of signal voltage > 3.3 s Active grille air shutter feedback failure not detected 	• 0.5 s • Continuous	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544, Checking", page 1155 .

DTC / Monitor Strategy Scrip- tion	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P05C 0 Active Grille Air Shutter Module "A" Over Temperature	Internal over- voltage detec- ted Internal over- temperature detected		0.3 sContinuous	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544, Checking", page 1155.
P0601 Engine Control Module (ECM): Checksum Verification ule Memory Check sum Error	Calibration checksum incorrect Software checksum incorrect		• 1.0 s • Continuous	• 2 DCY	 Replace the Engine Con- trol Module - J623 Refer to appropri- ate repair manual.
P0603 Internal Control Module (ECM): Communication Check Keep Alive Memory (KAM) Error	Device 1: SPI communication with ATIC failure Device 2: SPI communication with ATIC failure SPI communication with ATIC failure ATIC failure	oo in the difference of the contract of the co	• Continuous	• 1 DCY • 2 DCY	trol Module - J623- Refer to appropriate repair
Engine Control Module (ECM): Fuel Injection Valves In- ternal Hard- ware Check	sation failure	Shimoo to again to light doo you	• 4.9 s • Once / DCY	-ĐA nagsı	Manual.

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
			Continuous			
	Time reference from microcontroller during initialisation failure Communication between		 4.9 s Once / DCY 1.8L 4.320 0° 			
	tion between microcontrol- ler and SDI- Driver power- stage failure	ilike dunde Es auth	• CRK • CRK • CRK • Contin- uous	_{agen} AG. Volkswa	gen AG does not guaran	iccoreccept and in the contract of the contrac
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			cted by copyrights	Ploto	DA nagswaylo V Vding	ine

S	TC / De- crip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
S 1 P(C)	crip- tion 0606 Con- trol Mod- ule Pro- ces- sor	Barometric Pressure (BARO) Sensor Engine Standing: Cross Check	Case 1: charged engine Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa Case 2: non charged engine Diff. BARO mean value vs. MAP mean value vs. MAP mean value not calibrated kPa Diff. deviation BARO mean value (MAP mean value, BARO mean value	Conditions Case A: engine stop during DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle not calibrated shot get at the stop of the	• 3.0 s • Continuous • Continuous	• 2 DCY	
			alive time and MAP @ ECM keep alive time) not calibrated kPa				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Barometric Pressure (BARO) Sensor ECM Keep Alive-Time: Cross Check	Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa	 Vehicle speed < 1 km/h 	ΔG. Volkswage	n AG does not guar	The of acceptany lighting with respect to the
	Barometric Pressure Sensor Out Of Range Low	Measured barometric pressure < 45.0 kPa		• 5.0 s • Continuous		espect to the con
	Barometric Pressure Sensor Out OF Range High	Measured barometric pressure > 115.0 kPa				ectiness of info _{rn}
	Knock Con- trol Internal Hardware Check	Knock control malfunction: signal acquisi- tion error	Engine running	6.4 sContinuous		ess of information in this ook the state of
	Engine Control Module (ECM): EE- PROM	EEPROM in- formation fail- ure	Protected by Gody Gody Gody Gody Gody Gody Gody God	• 1.0 s • Contin- uous	DA Nagawaylo V ton	Pehrqo Jigan
	Check	Decryption of NVMCrypt failed Finished	- ₁₀ e3019	• 1.0 s • Once / DCY	⊅A _{⊓ane} .	
	-	NVMCrypt integrity error • Communica-				
		tion between sample soft- ware and pro- duction hard- ware error				
	Engine Control Module (ECM): RAM Inter- nal Hard- ware Check	RAM error de- tected	Microcontroller failure Reset counter > 1.0 [-]	• 0.04 s • Once / DCY		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	ECM: Random Access Memory (RAM) Functional Check	Monitoring module check failed		0.5 s Continuous		
	Engine Control Module (ECM): An- alog / Digital Converter Function Monitoring: A/D Con- verter	• Diff. A/D- channel 1 vs. A/D channel 2 > 0.30 V		• 0.5 s • Continuous		
	Engine Control Module (ECM): Communi- cation Check	SPI communication with likeward failed SPI communication with ATIC implausible	agert AG does not guarantee	10.0 s Continuous		
All Market Market State of the	Engine Control Module (ECM): Electronic Throttle Control Module Function	 Monitoring of difference between actual and set point torque value Engine torque overflow > 45.0 - 350.0 	Throttle actuator commanded on	• 0.5 \$ • Continuous	ct to the co	
or commercial purposes	Monitoring: Torque	 Monitoring of torque difference integration Integrated engine torque > 		• 0.01 s • Continuous	the correctness of interview	
	Engine Control Module (ECM): Electronic Throttle Control Module Function Monitoring: Engine Speed Limitation	• Engine speed > 1,760 RPM	• Engine speed limitation active Injection In	• ₁₀ 0.5 s		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Engine Control Module (ECM): Electronic Throttle Control Module Function Monitoring: A/D Converter	Internal check failed		• 0.5 s • Continuous		
P0607 Con- trol Mod- ule Per-	Barometric Pressure (BARO) Sensor Short To Ground	Barometric pressure sen- sor voltage < 0.20 V	_{ragen} AG. Volkswagen AG o	• 0.5 s • Continuous	• 2 DCY	Replace the Engine Con- trol Module - J623 Refer to appropri- ate repair
for- manc e	Barometric Pressure (BARO) Sensor Short To Battery Plus	Barometric pressure sen- sor voltage > 4.80 V	_{ragen} AG. Volkswagen AG d	Suarante	Oraccaprille	manual.
P0634 Con- trol Mod- ule In- ternal Tem- pera- ture "A" Too High	Turbo- charge (TC) Boost Pressure Control Over Tem- perature	Bypass valve driver temper- ature (hard- ware values) > 170 – 190° C	Control valve commanded on	• 0.4 s • Continuous	• 2 DCY Mithrespector	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
	Throttle Actuator Adaptation Value Monitoring	age <= 9.04 V	Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) active	Once per life-time	· 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34
e/Per- for- manc e Bank 1	Throttle Actuator Adaptation Value Monitoring	Actual TPS 1 or 2 voltage voltage ref. point > 0.07 V Actual TPS - ref. point > 0.503° TPS	 Throttle adaptation demanded websites the second of the sec	• Q.01's • Once / DCY		Throttle Valve Control Module GX3, Checking". page 1169
			• ECT 5 – 120° C			



	thorises		(ante			
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
or commercial purposes, in part or in whole is not be	Throttle Actuator monitoring of position Throttle Actuator monitoring of position Throttle Actuator Adaptation Value Monitoring	or 2 voltage - voltage ref. point > 0.25 V • Accelerator pedal value > 99.9% • Engine speed > 64 RPM	Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) active	Oper lime Oper lime		
	Throttle Actuator Adaptation Value Monitoring	Actual TPS - ref. point > 0.503° TPS	 Throttle adaptation demanded Accelerator pedal value < 99.9% Engine speed < 64 RPM Vehicle speed < 2 km/h IAT > 5° C ECT 5 – 120° C 			
P0642 Sensor Reference Voltage "A" Circuit Low	Supply Voltage Out Of Range Low	Analog output supply voltage < 4.62 V		0.2 sContinuous	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0643 Sen- sor Refer- ence Volt- age "A" Circuit High	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range High	Analog output 1 supply volt- age > 5.43 V		• 0.2 s • Continuous	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
Sen- sor	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range Low	Analog output Supply voltage < 4.62 V	agen AG does not guarantes o	O.2 s Continuous Cooperation Coop	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
Reference Volt- age Circuit High	Engine Control Module (ECM): 5V Supply Voltage Out Of Range High		Actuator commanded off	• 0.2 s • Continuous	2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 Refer to appropriate repair manual.
ı. 000 <i>.</i>	Engine Compo- nents Sup- ply Voltage Relay Open Circuit	age lower range >= 1.90 - 2.30 V	• n Actuator commanded off	• 1.0 s • Continuous	• 2 DCY	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271 , Checking", page 1145 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina, tion	Component Diagnostic Procedure
Actua- tor Sup- ply Volt- age "A" Circuit Low	Engine Compo- nents Sup- ply Voltage Relay Short To Ground	Output voltage (hard-ware values) < 1.99 – 2.30 V V Output voltage (hard-ware values) < 2.30 V	Actuator commanded off	• 1.0 s • Continuous	• 2 DCY	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J274 . Checking page 1145
P0659 Actua- tor Sup- ply Volt- age "A" Circuit High	Engine Compo- nents Sup- ply Voltage Relay Short To Battery Plus	 Output current > 1.0 - 2.3 A Actuator temperature (hardware values) > 175 - 195° C 	• Actuator commanded on	• 1.0 s • Continuous	Cawellov Vahlor	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271 , Checking", page 1145
ECM/ PCM Power Relay	Main Relay Rationality Check Dur- ing Engine Off	 Sensed circuit voltage > 6.0 V 	Main relay commanded offFor time >= 0.3 s	• 0.1 s • Continuous	• 2 DCY	 Check the Motronic En- gine Control Module Pow- er Supply
Con- trol Circuit Low	Main Relay Short To Ground	Output volt- age < 1.85 – 2.28 V (hard- ware values)	 Relay commanded off For time > 40.0 ms 	0.2 s Continuous		Relay - J271 Refer to ⇒ "3.6.23_ Motronic En- gine Control Module Pow- er Supply Relay J271, Checking", page 1145.
Relay	Main Relay Rationality Check Dur- ing Engine Running	 Sensed circuit voltage < 5.0 V 	Main relay commanded onFor time >= 0.1 s	• 0.1 s • Continuous	• 2 DCY	Check the Motronic Engine Control Module Power Supply
Con- trol Circuit High	Main Relay Short To Battery Plus	 Main relay driver temperature > 175 – 195° C Or Main relay output current > 1.0 – 2.3 A 	 Main relay commanded on For time >= 0.4 s 	• 0.2 s • Continuous		Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0698 Sen- sor Refer- ence Volt- age "C" Circuit Low	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range Low	Analog output 3 supply volt- age < 4.62 V		• 0.2 s • Continuous	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
P0699 Sen- sor Refer- ence Volt- age "C" Circuit High	Engine Control Module (ECM): 5V Supply Voltage Out Of Range High	Analog output 3 supply volt- age > 5.43 V Authorised by VolksW Authorised by Volk	agen AG. Volkswagen AG do	• 0.2 s • Continuous	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.

1 Pressure (FRP) Sen-sor Ration-ality Check Low Sen-sor Inappro- Sen-sor	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
phate	P12A 1 Fuel Rail Pressure Sensor Inappropriate- ly Low	Fuel Rail Pressure (FRP) Sen- sor Ration- ality Check Low	Deviation lambda of controller included adaptation < -45.0% High pressure controller output > 8 mg Assets authorized by Volkewas Assets authoriz	 General: Engine speed > 608 – 1,088 RPM Fuel mass set point 1.99 – 20.01 mg/stk Time after change to DFI not equipped s Time after engine start > 5.0 s Engine warm-up not calibrated Catalyst heating not calibrated Full load not calibrated Catalyst purge not calibrated Catalyst purge not calibrated. Evap purge functionality diagnosis not active Depending on low dynamic conditions: Fuel mass set point lower range 	• 10.0 s • Continuous	accept any liability with respect to the correctness of information in this cocurre	- Check the Fuel Pressure Sensor - G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring G. Vilmeage Length	MIL Illumina- n AG does not guara	
P12A 2 Fuel Rail Pressure Sensor Inappropriate ly High	Fuel Rail Pressure (FRP) Sen- sor Ration- ality Check High	Deviation lambda of controller included adaptation > 30.0% High pressure controller output < 10 mg	point 4.01 – 29.99 mg/stk	• 10.0 s • Continuous	• 2 DCY	Check the Fuel Pressure Sensor G2472. Refer to ⇒ "3.6.16" Fuel Pressure Sensor G247, Checking", page 1131.



			worise ^{cc}			arante.
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P13E A Cold Start Igni- tion Tim- ing Per- for- manc e Off Idle	Ignition Control (IC) Ignition Timing Monitor @ Part Load	Ratio between ignition angle efficiency integral and time at part load > 0.12 [-]. Output Description: Output Description:	• Ignition angle efficiency setpoint<= 0.88 [-] %	DCY	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
Throt- tle Ac- tuator "A" Con- trol Motor	Throttle Actuator Out Of Range	Control duty cycle > 98.0%	 Throttle position not at min. value Throttle adapta- tion not active Throttle actuator commanded on 	0.7 s Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle
Circuit Rang e/Per- for- manc e	Throttle Actuator Rationality Check	Difference between throttle position set point and throttle flap opening angle for electronic throttle control > 2.998 – 24.982° TPS	 Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) not active Throttle actuator commanded on Diff. throttle position set point vs. throttle flap opening angle <= 1.999; > -1.999° TPS 	• 0.5 s • Continuous		Valve Control Module GX3, Checking". page 1169

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Airbag Safety Measures Due To Crash With Airbag Activation	• Airbag(s) acti- commercial part of the		• 0.0 s • Continuous	• 2 DCY	- After proper repair of damage, erase the Engine Control Module 3 J623- DTC. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21 .
P169 A Load- ing Mode Active	Engine Control Module (ECM): Transport Mode Function Monitoring: Mode Change	Transport mode active Transport mode ac	 Vehicle speed < 5 km/h Max trip mileage since initial vehicle start-up < 100.0 km During ECM keep alive-time after ignition off Engine speed 0 RPM Production mode not active For hybrid: Drive motor off 	Continuous	• 1 DCY	- Vehicle is in Transport Mode (Loading Mode). It can be turned off with a scan tool or will automatically switch off after approximately 100 km (62.15 miles) have accumulated on the vehicle. May need to perform readiness check. Refer to ⇒ "3.2 Readiness Code", page 14.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	agnostic Proce- dure
P2004 Intake Mani- fold Run- ner Con- trol Stuck Open Bank 1	Intake Manifold Runner Control (IMRC) Ac- tuator Stuck Open	• Signal voltage > 1.89 V • For time >= 1.5 s	 Flap commanded off Time after engine start > 5.0 s Flap commanded on Time after engine start > 5.0 s 	• 0.2 s • Continuous	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336 - Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336 - Checking", page 1137 . - Check the Intake Manifold Runner Control Valve - N316 - Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316 - Checking", page 1135 .
P2006 Intake Mani- fold Run- ner Con- trol Stuck Close d Bank 1	Intake Manifold Runner Control (IMRC) Ac- tuator Stuck Close	9	Flap commanded on Time after engine start > 5.0 s Palagold Sylventing Palagold Sylventing Palagold Sylventing Palagold Sylventing	• 0.2 s • Continuous	• 2 DCY	Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336. Checking", page 1137. Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316. Checking", page 1135.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Mani- fold Run-	Manifold Runner Control (IMRC) Ac-	Output voltage lower range >= 1.92 - 2.21 V Output voltage upper range (hardware values) <= 2.85 - 3.25 V Nolkswagen AG. Output volt-	Engine running Actuator commanded off Volkswagen AG does not gu	• 2.0 s • Continuous	• 2 DCY	- Check the Intake Manifold Runner Control Valve - N316 - Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135 . - Check the Intake Manifold Runner Position Sensor - G336 - Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor - G336 - Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137 .
Intake	Manifold Runner Control (IMRC) Ac- tuator Short	• Output voltage (hard-ware values < 1.92 – 2.21 V	Engine running Actuator commanded off	Continuous	• 2 Dicy	- Check the Intake Manifold Runner Control Valve - N316 - Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135 . - Check the Intake Manifold Runner Position Sensor - G336 - Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor - G336, Checking", page 1137 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- waders with Enable 4 Conditions	Time	MIL Illumina- tion	agnostic Proce-
	Manifold Runner Control (IMRC) Actuator Short To Battery	> 4 0 – 7 0 A	 Engine running Actuator commanded on 		• OF 2 DCY	fold Runner
	end service of commercial purposes, in part or in whole,	TO BUILDO THOUNDOON APPE	BN PG. Protect	gaway.	In the second se	page 1137
Mani- fold Run- ner Posi- tion	Intake Manifold Runner Control (IMRC) Ac- tuator Short To Ground / Open Cir- cuit	Intake manifold runner flap position sensor voltage < 0.20 V	Engine start not active	0.04 sContinuous	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336 . Checking", page 1137 .
						- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.

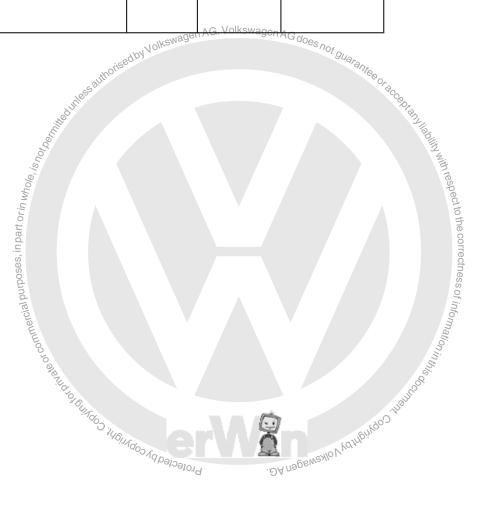
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	(C)	Component Diagnostic Procedure
Mani- fold Run- ner Posi-	Intake Manifold Runner Control (IMRC) Actuator Short To Battery Plus	• Intake manifold runner flap position sensor voltage > 4.80 V	• Engine start not active	• 0.04 s • Continuous	Cospect to the correctness of information in this object.	- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137. - Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.
P2088 "A" Cam- shaft Posi- tion Actua- tor Con- trol Circuit Low Bank 1	Variable Valve Tim- ing (VVT) Intake Ac- tuator Short To Ground	Output voltage (hard-ware values) < 1.92 – 2.21 V	Actuator commanded off	• 2.0 s • Continuous	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205, Checking", page 1105 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2089 "A" Camshaft Position Actuator Control Circuit High Bank 1	Valve Tim- ing (VVT) Intake Ac- tuator Short To Battery	 Power stage temperature > 160 - 200° C Output current > 8.0 - 12.0 A 	Actuator commanded on Actuator commande	 2.0 s Continuous 	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 , Checking", page 1107 Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 - N205 Refer to ¬ Camshaft Adjustment Valve 1 - N205 Refer to ¬ Camshaft Adjustment Valve 1 - N205 Refer to ¬ Camshaft ¬ Camsh
P2096 Post Cata- lyst Fuel Trim Sys- tem Too Lean Bank 1	Fuel Sys- tem Out Of Range Low	adaptation value & -0.05 [-] who was a second and part or in who was a second part or in which was	 2nd lambda con- 	• 81.0 s • Continuous	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to approximate the fuel pressure of the fu
		Impo to aliamid to t	grated mass for fuel in oil < 255.0 [-] • Choice of: O2S rear (binary) check not active • O2S rear (binary) check finished	G.	A VOIKENBAGEN A	priate repair manual. - Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2097 Post Cata- lyst Fuel Trim Sys- tem Too Rich Bank 1	Fuel System Out Of Range High	• adaptation value > 0.05 [-] Electronic throttle yello	 2nd lambda control n.a. Catalyst purge not active Injection mode change (DFI/MFI) mot active Engine speed >= 704 RPM Counter of integrated mass for fuel in oil < 255.0 [-] Choice of: O2S rear (binary) check not active O2S rear (binary) check finished 		• 2 DCY	Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to 3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7 , Checking
P2100 Throt- tle Ac- tuator "A" Con- trol Motor Cir- cuit/ Open	Throttle Ac- tuator Open Circuit	driver load resistance > 200,0 kΩ	Difference between measured and filtered throttle position <= 119.50° TPS Throttle actuator commanded off Delogood	• 0.1 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169 .
Throt-	Throttle Actuator Over Temperature	Electronic throttle valve driver temperature (hardware values) > 170.0 – 190.0° C	Throttle actuator commanded on	• 0.1 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
commercial purposes, in part or in whole, is holde,	Throt- tle Ac- tuator "A" Con- trol Motor Circuit High	Throttle Actuator Short Circuit	Electronic throttle valve driver current > 9.3 – 15.0 A en AG. Volkswagen AG	• Throttle actuator commanded on	• 0.1 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169
	P2122 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "D" Circuit Low	Accelerator Pedal Posi- tion (APP) Sensor 1 Out Of Range Low	Signal voltage sensor 1 < 0.39 V		0.3 s Contin- Gous Contin- Gous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .
	P2123 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "D" Circuit High	Accelerator Pedal Posi- tion (APP) Sensor 1 Out Of Range High	sensor 1 > 4.86 V	DEMSHON MATHON AOKEMSO	• 03 s • Contin- Coucus	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .
	P2127 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "E" Circuit Low	Accelerator Pedal Posi- tion (APP) Sensor 2 Out Of Range Low	√ି Signal voltage sensor 2 < 0.19 V	Den	0.3 sContinuous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .
	Throt-	Accelerator Pedal Posi- tion (APP) Sensor 2 Out Of Range High	Signal voltage sensor 2 > 2.80 V		0.3 sContinuous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Accelerator Pedal Posi- tion (APP) Sensor 1 and 2 Ra- tionality Check	Difference be- tween signal voltage sen- sor 1 and sen- sor 2 > 0.10 – 0.12 V		• 0.4 s • Continuous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 1101.



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length _o	MIL Illumina- tion	Component Diagnostic Procedure
Sys-	Fuel System Direct Fuel Injection System Too Lean	Adaptive value >= 28.0%	 Air mass > 60.0 mg/stk 1.8L ECT @ cylinder block > 55° 	• 5.0 s • Continuous	• %2 DCY	Check vac- uum lines visually for leaks.
Off	@ Paft		 2.0L ECT @ cylinder block > 60° C IAT @ manifold > -48° C AAT > -48° C Lambda set point 0.92 - 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 - 200.0 g Fuel mass 17.99 - 51.02 mg/stk Engine speed 1,280 - 4,000 mg/st Low dynamic conditions: 		• 2 DCY	Check the intake system visually for leaks (false air).
	s, inpar		 IAT @ manifold > -48° C 		e correc	- Check the
	sesodur		• AAT > -48° C		oiness.	fuel pressure and delivery quantity. Re-
	roial pu		 Lambda set point 0.92 – 1.05 [-] 		of infon	fer to fuel system me-
	comme		 Lambda control closed loop 		mation,	chanical test- ing in
	to oreally life		Integrated air mass >= 5.0 – 200.0 g		STILL OF THE STILL	⇒ "3.1 Pre- liminary Check", page 13 and/
		Month Copyright	 Fuel mass 17.99 51.02 mg/stk 	, ibiyd	0,	or to appro- priate repair manual.
		HADDAGDDAG	• Engine speed № 1,280 – 4,000 പര6° RPM	NZAIOV KOTES		- Check the Fuel Injec- tors . Refer to
			 Low dynamic conditions: 			⇒ "3.6.14 Fuel Injec-
			Diff. engine speed vs. aver- aged engine speed for engine			ing", page 1127
			speed dynamic detection < 100 – 175 RPM			Check the Oxygen Sensor 1 Before Catalytic Converter -
			 Diff. air mass vs. averaged air mass for load dy- namic detection < 30.01 – 60.0 mg/ 			GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before
			 Diff. between reference and actual fuel pressure, high side not calibrated 			Catalytic Converter GX10 Checking", page 1152
			kPa • Integrated air			- Check the Fuel Delivery
			mass > 5.0 g			Unit - GX1- / Fuel Pump Control Mod-
			 Evap purge valve closed 			ule - J538 Refer to
			 Canister load <= 1.20 [-] 			⇒ "3.6.13 Fuel Delivery Unit GX1 /
			Evap purge flow at max. value			Fuel Pump Control Mod- ule J538,

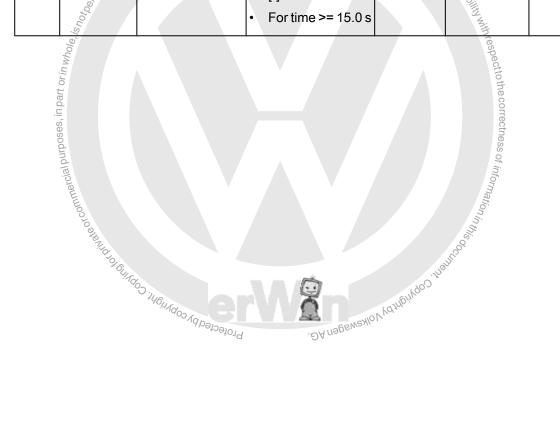
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	2.2	rotal purposes, in fact of m whole, is not only militing the purpose of militing the purpose of				Testing", page 1125. Check the Intake Manifold Sensor - GX9- Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. Check the Fuel Pressure Regulating Valve - N276- Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276. Checking", page 1120
		and leo on mercial purposition of the purposition o	Protected by cool	. DA negenex	ON KONURINGO STABILI	sure Regulator Valve N276, Checking", page 1129.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2178 System Too Rich Off Idle Bank 1	Fuel System Direct Fuel Injection System Too Rich @ Part Load	• Adaptive value <= -25.0%	 Air mass > 60.0 mg/stk 1.8L ECT @ cylinder block > 55° C 2.0L ECT @ cylinder block > 60° C IAT @ manifold > -48° C AAT > -48° C Lambda set point 0.92 - 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 - 200.0 g Fuel mass 17.99 - 51.02 mg/stk Engine speed 	• 5.0 s • Continuous	• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 Check the Oxygen Senotes
	in whole .	ous in the sauthonise do the s	1,280 – 4,000 RPM	≇n AG _{does not g}	Uarantee or accept any to	sor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 . Check the Fuel Delivery Unit - GX1-/
	n part or i	THOU TO BUILDO THOU THOU THOU THOU THOU THOU THOU THO	 Low dynamic swage conditions: Diff. engine speed vs. averaged engine speed for engine speed dynamic detection < 100 – 175 RPM Diff. air mass vs. averaged air mass for load dynamic detection < 30.01 – 60.0 mg/stk Diff. between reference and actual fuel pressure, high side not calibrated kPa Integrated air mass > 5.0 g Evap purge valve closed Canister load <= 1.20 [-] Evap purge flow at max. value 	JA Naganagan AG	KQIMBIMOO THEIMOO	Fuel Pump Control Module - J538 Refer to 3.6.13 Fuel Delivery Unit GX1 / Euel Pump Control Module J538 , Testing",

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Conditions	Time Length	MIL Illumina- tion	agnostic Proce- dure	
			Dependence on canister purge min: Lower limit of lambda controller output not calibrated Dependence on canister purge limit of lambda controller output not calibrated Evap purge flow at min. value		a. vanswagen AG	ing;, page 1139	otany liability with respect to the correc
			Solving to the solvin	Protected by	-ĐA ne	- Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276. Checking". page 1129.	tness of information in this odo,

P2181 Engine Cooling work	DTC /	Monitor	Malfunction Cri-	Secondary Parame-	Monitoring	MIL Illumina-	Component Di-
Cooling System System Cooling system tem between the performance of th	De- scrip- tion	Strategy Description	teria and Thresh- old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure
l	Cooling System Performanc	Cooling System Cooling System Perform- ance Not In The Expec- ted Range	Cooling system temperature too low after a sufficient mass air flow (indication by a mass air flow based temperature model) < 66 – 76° C Case 2: Filtered ECT decreases under a threshold value after reaching a high temperature level < 61° C For time not calibrated [s]	 ECT @ first start (lower threshold) >= -10° C ECT @ first start (upper threshold) <= 47 - 57° C AAT > -10° C Start of fault decision: Modeled ECT / Section (Completed ECT) / Section	(Unified 430.0) s • Once / DCY	not guarantee or accep	Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117. - Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to • "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to • "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119. - Check the After Run Coolant Pump - V51 Refer to ⇒ "3.6.2 After Run Coolant Pump V51, Checking", page 1103. - Check the engine coolant thermostat. Refer to appropriate repair man-
<= 215° C				<= 215° C			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Conditions for time: relative MAF > 5.00 %			
		umorised by Volkswagen /	Vehicle speed G. ∀not calibrated km/ h			
	Sol	uthorised E	• Modeled ECT > 65° C	9Uarantee Oracce		
	in i		• Engine stop counter < 255.00 [-]		Retay libility with	
	isnoto		• For time >= 15.0 s		HI WHIT	



De- S	Monitor Strategy escription	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
gine Cool- ant Sei Tem- pera- Ou ture Cro	polant empera- re (ECT) ensor @ adiator utlet oss neck	 High side: reference measuring Diff. ECT @ radiator outlet @ cold start vs. IAT @ manifold @ cold start vs. ECT @ cylinder block @ cold start not calibrated [K] Diff. ECT @ radiator outlet @ cold start vs. AAT @ cold start vs. ECT @ radiator outlet @ cold start vs.	 = 360.00 min Engine off time plausible Time after engine start <= 6553.5 s Depending on temperature slope @ cold start: Diff. actual IAT @ manifold vs. IAT @ manifold ws. IAT @ manifold @ start of DCY 256.0 K Diff. actual ECT @ cylinder block ws. ECT @ cylinder block ws. ECT @ cylinder block ws. ECT @ radiator outlet vs. ECT @ radiator outlet ws. ECT @ radiator outlet @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Depending on mean value condition Mean value of all temperature sensors @ cold start >= -256° C Number of valid sensors >= 2.00 [-] 			- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83- Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119 .	_{.ct} tothecorrectness of ir

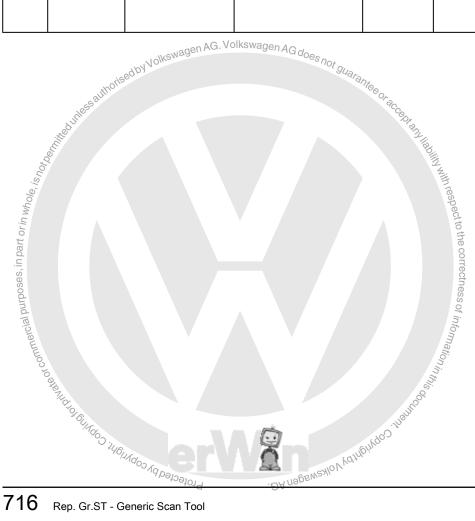
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Min. amount of faulty refer- ence meas- urements to detect defec-	Diff. actual ECT @ cylinder block vs. min. ECT @ cylinder block not calibrated [K]			
		tive sensor 2.00 [-]	Diff. actual AAT vs. min. AAT < 4.5 K			
			Diff. actual ECT @ radiator outlet vs. min. ECT @ radiator outlet < 4.5 K			
En- gine Cool- ant Tem- pera-	Engine Coolant Tempera- ture (ECT) Sensor @ Radiator Outlet Short	• Sensor voltage <= 0.30 V		0.5 s Continuous	• 2 DCY	 Check the Engine Cool- ant Temper- ature Sensor On Radiator Outlet - G83 Refer
ture Sen- sor 2 Circuit Low	To Ground		o striked under sauthorised by	Volkswagen AG	.VolkswagenAG	to Second State S
En- gine Cool- ant Tem- pera- ture	Engine Coolant Tempera- ture (ECT) Sensor @ Radiator Outlet Short To Battery /		Time after engine start > 60.0 s	• 0.5 s • Continuous	• 2 DCY	 Check the Engine Cool- ant Temper- ature Sensor On Radiator Outlet - G83 Refer to
Sen- sor 2 Circuit High	Open Cir- cuit		Copyright of Commercial purposes, mp.			⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119
			ENIGHO BUNDOS HOUNDOS	10Sected by	Polityca:	- Check the Engine Cool- ant Temper- ature Sensor - G62- Refer to "3.6.9 En- gine Coolant
				·a	5) 4 2	gine Coolant Temperature Sensor G62, Checking", page 1117

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2187 Sys- tem Too Lean	Fuel Sys- tem Direct Fuel Injec- tion System Too Lean	Case 1:Adaptive value >= 2.40 mg/stk	 Air mass > 60.0 mg/stk ECT @ cylinder block > 55° C 	• 5.0 s • Continuous	• 2 DCY	Check the vacuum lines visually for leaks.
	@ Idle	• Adaptive value not calibrated kg/h • Lambda set point 0.92 – 1.05 [-] • Lambda control closed loop • Integrated air mass >= 5.0 – 200.0 g • Vehicle speed < 6 km/h • Low dynamic conditions: • Diff. engine speed vs. averaged engine		 Check the intake system visually for leaks (false air). Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. Check the Fuel Pres- 		
		le, is not began	 speed for engine speed dynamic detection < 100, 175 RPM Diff, air mass vs. averaged air mass for load dynamic detection < 30.01 – 60.0 mg/stk Diff. between reference and ac- 	gen AG. Volksw	agen AG does not g	Fuel Pressure Sensor G247 Checking page 1131 Check the
		eorcommercial purposes, in part or in whole, is not be,	tual fuel pressure, high side not calibrated kPa Integrated air mass > 5.0 g Fuel mass upper range < 0.0 – 17.0 mg/stk Fuel mass lower range not calibrated and a side.			tors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 . Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Re-
			Engine speed 704 – 992 RPM Engine not calibrated Evan purge Valve	erW o _{1d}	.ĐA nagewaylou	fer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10 Checking", page 1152

		901		9425			
	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Time Length	/IIL Illumina- tion	Component Diagnostic Procedure
ر ما part or in who	Mula to the property of the pr	** Pescription	Protectedb	 Canister load <= 1.20 [-] Evap purge flow at max. value Depending on canister purge min: Lower limit of	Mability with respect to the correctness of Information in this or the correctness of Information in this or the correctness of		- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 . - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 . - Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129 .

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Sys- tem Too Rich at Idle	Fuel System Direct Fuel Injection System Too Rich @ Idle	 Case 1: Adaptive value <= -2.40 mg/stk Case 2: 	 Air mass > 60.0 mg/stk 1.8L ECT @ cylinder block > 55° C 	• 5.0 s • Continuous	• 2 DCY	Check the fuel pressure and delivery quantity. Refer to fuel system me-
	Bank 1		Adaptive value n.a. kg/h	• 2.0L ECT @ cyl- inder block > 60° C			chanical test- ing in ⇒ "3.1 Pre- liminary
				• IAT @ manifold > -48° C			Check", page 13 and/ or to appro-
				• AAT > -48° C			priate repair
				• Lambda set point 0.92 – 1.05 [-]			manual. - Check the
			a Maller	Lambda control closed loop			Fuel Injec- tors . Refer to ⇒ "3.6.14
		morised by Voll	_{(SW} agen AG. Volkswage	*Adhtegrated air mass≽= 5.0 – 200.0 g			Fuel Injec- tors , Check- ing", page 1127
	dune	55 21111		Vehicle speed < 6 km/h	Dr.		- Check the Oxygen Sen-
ļ	r pormite			conditions:	W lightlift		sor 1 Before Catalytic Converter -
n part or in whole, is n				-48° C • AAT > -48° C • Lambda set point 0.92 – 1.05 [-] • Lambda control closed loop • Adntegrated air mass >= 5.0 – 200.0 g • Vehicle speed < 6 km/h • Low dynamic conditions: • Diff. engine speed vs. averaged engine speed for engine speed dynamic detection < 100 – 175 RPM • Diff. air mass vs. averaged air mass for load dynamic detection < 30.01 – 60.0 mg/	ast and liability with respect to the correctness of		GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic
ercial purposes, ir				Diff. air mass vs. averaged air mass for load dy- namic detection < 30.01 – 60.0 mg/ stk	rectness of inforn		Converter GX10, Checking", page 1152.
MMO	O O STRAND TO TO	Acto Jugurdos Kali		Diff. between reference and actual fuel pressure, high side not calibrated kPa	ss of information in this good that		Fuel Delivery Unit - GX1- / Fuel Pump Control Mod- ule - J538 Refer to ⇒ "3.6.13 Fuel Delivery
		JUDINADO NAN	Protected .	Integrated air mass > 5.0 g			Unit GX1 / Fuel Pump Control Mod- ule J538,
				mg/stk			Testing", page 1125 .
				Fuel mass lower range not calibra- ted mg/stk			Check the Intake Manifold Sensor -
				• Engine speed 704 – 992 RPM			GX9 Refer to ⇒ "3.6.20 In-
				Engine n.a.			take Mani- fold Sensor

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
tion			 Evap purge valve closed Canister load <= 1.20 [-] Evap purge flow at max. value Depending on canister purge min: Lower limit of lambda controller output not calibrated Upper limit of lambda controller output not calibrated Evap purge flow at min. value 			GX9, Checking", page 1139. - Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, and the second control of the second control o
						Checking", page 1123



DTC / Moni De- scrip- tion Descrip	egy te	Malfunction Cri- eria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2195 Oxyger O2 Sensor Sensor Rationa Signal Biase d/ Down- Stuck Lean Oxyger Bank Sensor 1 Sensor	rs Front ality - Up- And	real >= 0.00 V	 O2S rear ready ECT >= -48° C Limited dynamic conditions active Mass air flow > 15.0; < 300.0 kg/h Catalyst purge not active Engine speed > 1,152 RPM Exhaust gas temperature at O2S rear > -273; < 800° C Combustion mode change not active 	• 72.0 s • Continuous	• 2 DCY	- Check the Oxygen Ser sor 1 Before Catalytic Converter - GX10 - Refer to ⇒ "3.6.26 Oxygen Ser sor 1 Before Catalytic Converter GX10, Checking", page 1152 . - Check the Fuel Deliver Unit - GX1-Fuel Pump Control Module - J538 - Refer to ⇒ "3.6.13 Fuel Deliver Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 .
ou si de la	sedbyVolk	_{.sw} agen AG. Volkswa	gen AG does not guarantes or a	CC BRANN LIABILITY MITTH		- Check the litake Manifold Sensor GX9 Refeto ⇒ "3.6.20 litake Manifold Sensor GX9, Checing", page 1139
THO TO BRANCH OF THE STATE OF T	Woo Vabo		Gen AG does not guarantee or a	espect to the corress of information in this document.		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Sen- (((sor R) Signal C Biase s d/ E Stuck s Rich (C)	Sensors O2S) Front Rationality Check - Up- stream And Down- stream Dxygen Sensor Sig- nal	 Lambda value < 0.85 [-] And O2S rear voltage <= 0.25 V 	O2S rear readyECT >= -48° C	• 72.0 s • Continuous		- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152. - Check the Fuel Delivery Unit - GX1-/ Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1/ Fuel Pump Control Module J538 Testing", page 1125. - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 Checking", page 1139. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
C Cylinder 1 Air- Fuel Ratio Imbal- ance	Fuel System Predicted Adaptation Out Of Range Low	 Cylinder 1: adaptation value unweighted < -13.0% Cylinder 2: adaptation value unweighted < -13.0% Cylinder 3: adaptation value unweighted < -13.0% Cylinder 4: AG. Volkswagen adaptation value unweighted < -13.0% 	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] Catalyst heating not active Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure not calibrated kPa Mass fuel flow set point 12.0 – 29.99 mg/stk Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start not calibrated [-] Time after engine start not calibrated s Integrated mass air flow >= 0.75 – 7.0 kg Rough road not detected 1.8L Engine speed 1,248 – 2,816 RPM 2.0L Engine speed 1440 – 3008 RPM Dependence on oxygen sensor diagnosis 	4 times Once / DCY A times Miliability with respect to the correctness of information in this respect to the correctness of information in	• 2 DCY	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking". page 1127. Check the Ignition Coils with Power Output Stage. Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage. Checking". page 1133.

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
3		• Cylinder 1: • adaptation value weighted < -10.0% • Cylinder 2: • adaptation value weighted < -10.0% • Cylinder 3: • adaptation value weighted < -10.0% • Cylinder 4: • adaptation value weighted < -10.0% • Cylinder 4:	 Oxygen sensor dynamic diagnosis finished n.a. Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 2nd gear not active 3nd gear active 5nd gear active 6nd gear active 6nd gear active 7nd gear active 8nd gear not active Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0% Dynamic ignition angle < 0.10 [-] Additional conditions Misfire on currelly learn shifted cylinder not detected 	Wednight Copyright Williams of the Copyright of the Copyr	its with respect to the correctness of information in this ook, the correctness of the correctness	
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
D Cylin- der 2	Fuel System Predicted Adaptation Out Of	Cylinder 1: adaptation value un- weighted <	 Modeled catalyst temperature <= 900° C Lambda set value 	4 timesOnce / DCY	• 2 DCY	 Check the spark plugs visually for signs of foul-
Air- Fuel	Range Low	-13.0%	0.97 – 1.03 [-]			ing.
Ratio Imbal- ance		Cylinder 2:adaptation	Catalyst heating not active			 Check the in- take system visually for
G.1.00		value un- weighted < -13.0%	Fuel cut off not active			leaks (false air).
		• Cylinder 3:	• ECT 60 – 143° C			 Check the fuel pressure
		adaptation	• AAT >= -48° C			and delivery
		value un- weighted < -13.0%	Barometric pres- sure not calibra- ted kPa			quantity. Re- fer to fuel system me- chanical test-
		Cylinder 4:adaptation	Mass fuel flow set point 12.0 – 29.99 mg/stk			ing in <u>⇒ "3.1 Pre-</u> liminary
		value un- weighted < -13.0%	Segment adaptation completed			Check", page 13 and/ or to appro-
			Lambda control closed loop			priate repair manual.
			Catalyst purge not active			 Check the Fuel Injec-
		vsedby Volkswagen AC	•Vo Canister load <= 2.0 [-]	<i>Yar</i> s		tors . Refer to ⇒ "3.6.14 <u>Fuel Injec-</u>
	Eaul	norise	No gear shift	antee Ora		tors , Check- ing",
	xed Unless		• For segments 90.0 [-]	CCOPI	<i>2</i> ₁ .	page 1127 . - Check the Ig-
	Snotbernii		Segments after start not calibra- ted [-]		lidbility mitt	nition Coils with Power Output
rin wha.	(o)Out		Time after engine start not calibra- ted s		respectto	Stage . Refer to <u>⇒ "3.6.17 lg</u> - nition Coils
ss, in part o		hońsed by Volkswagen AC	• Integrated mass air flow >= 0.75 – 7.0 kg		the correct	With Power Output Stage
urpose			Rough road not detected		iness o	Checking", page 1133
Aision	ommero		 Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start not calibrated [-] Time after engine start not calibrated s Integrated mass air flow >= 0.75 - 7.0 kg Rough road not detected 1.8L Engine speed 1,248 - 2,816 RPM 2.0L Engine speed 1,440 - 3,008 RPM Dependence on 		f information	
	Oroniwate or	Protected by Copyright;	• 2.0L Engine speed 1,440 – 3,008 RPM	iŭ	inthis	
	* OUIA do	Wholing of	oxygen sensor di- agnosis	layleiydoo.iugu		
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Cylinder 1: adaptation value weighted < -10.0% Cylinder 2: adaptation value weighted < -10.0% Cylinder 3: adaptation value weighted < -10.0% Cylinder 4: adaptation value weighted < -10.0% Cylinder 4: adaptation value weighted < -10.0%	 Oxygen sensor dynamic diagnosis finished n.a. Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 2nd gear not active 4nd gear active 5nd gear active 6nd gear active 7nd gear active 8nd gear not active Imited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0% Dynamic ignition angle < 0.10 [-] Additional conditions Misfire on currently lean shifted cylinder not detected 	. Volkswagen A	G does not guarant	e of accept and literal with respect to the correctness of information in this order.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure										
E Cylin-	Fuel Sys- tem Predic- ted Adapta- tion Out Of	Cylinder 1: adaptation value un-	Modeled catalyst temperature <= 900° C	4 timesOnce / DCY	• 2 DCY	Check the spark plugs visually for signs of foul-										
Air- Fuel Ratio		Range Low	weighted < -13.0%	• Lambda set value 0.97 – 1.03 [-]			ing. - Check the in-									
Imbal- ance		Cylinder 2:adaptation	Catalyst heating not active			take system visually for										
	value un- weighted < -13.0%	Fuel cut off not active			leaks (false air).											
		Cylinder 3:	• ECT 60 – 143° C • AAT >= -48° C			Check the fuel pressure										
	adaptation value un- weighted < -13.0%	Barometric pres- sure not calibra- ted kPa			and delivery quantity. Re- fer to fuel system me- chanical test-											
		Cylinder 4:	Man f al flame (ing in ⇒ "3.1 Pre-											
			adaptation value un- weighted <	mg/stk • Segment adapta-			liminary Check", page 13 and/									
		-13.0%	tion completed Lambda control closed loop closed loop.	_{kswagen} AG. V	olkswagen AG doe	or to appro- priate repair ^s normanual.										
				Catalyst purge not active			 Check the Fuel Inject 									
			• Canister load <= 2.0 [-]			tors . Refer to ⇒ "3.6.14 <u>Fuel Injec-</u>										
			No gear shift For segments			Fuel Injectors, Checking", page 1127										
		, o 4 M				- Check the ig-										
					part or i _i	Segments after start not calibra- ted [-]		nition Coils with Power Output								
												oses, in	Time after engine start not calibra-			Stage . Refer to ⇒ "3.6.17 lg-
									, chal purposes, in part or in who	a all 110w /- 0.73 -			nition Coils With Power			
				7.0 kg Rough road not			Checking", page 1133									
		• 1.8L Engine speed 1,248 –			Output Stage, Checking", page 1133.											
					2.0L Engine	Protecte	. DA nagen	SHID VOINGING								
			Dependence on oxygen sensor di- agnosis													

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
	Description	Cylinder 1: adaptation value weighted < -10.0% Cylinder 2: adaptation value weighted < -10.0% Cylinder 3: adaptation value weighted < -10.0% Cylinder 4: adaptation value weighted < -10.0%	 Oxygen sensor dynamic diagnosis finished n.a. Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 2nd gear not active 3nd gear not active 4nd gear active 5nd gear active 6nd gear active 7nd gear active 8nd gear not active 7nd gear active 8nd gear not active 1mited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.10 [-] Dynamic window lambda control of the significant of th	agen AG. Volks		* Quarantee or accept any list	th resp.
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	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
or commercial purposes, In part or in whole, is not begin.	P219 F Cylinder 4 Air- Fuel Ratio		Old Value Cylinder 1: adaptation value un- weighted 2nAd -13.0% Cylinder 2:	• Modeled catalyst temperature <= 900° C • Lambda set value 0.97 - 1.03 [-] • Catalyst heating not active • Fuel cut off not active	4 times Once / DCY Madility with respect to the	• 2 DCY	
				agnosis			

						Γ_	 I
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
		 Cylinder 1: adaptation value weighted < -10.0% Cylinder 2: adaptation value weighted < -10.0% Cylinder 3: adaptation value weighted < -10.0% Cylinder 4: adaptation value weighted < -10.0% 	 Oxygen sensor dynamic diagnosis finished n.a. Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 2nd gear not active 3nd gear not active 4nd gear active 5nd gear active 6nd gear active 7nd gear active 8nd gear not active Imited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.10 [-] Dynamic window lambda control < 50% Dynamic ignition angle < 0.10 [-] Additional conditions Misfire on currently lean shifted cylinder not deviced 	Adoo Aq paysayo	AG. Volkswagen	AG does not guarantee of	Cacce Of any les
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Di- agnostic Proce- dure
O2 Sen- sor Posi- tive	Oxygen Sensors (O2S) Front Open Cir- cuit Pump Voltage	Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 1.20 V	 O2S front (linear) ready O2S ceramic temperature > 785° C 	• 2.3 s • Continuous	• 2 DCY	 Check the Oxygen Sen- sor 1 Before Catalytic Converter - GX10 Re-
Cur- rent Con- trol Cir- cuit/ Open	(VIP)	Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) <= 1.20 V	• For time >= 10.0 s			fer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10,
Bank 1 Sen-		• And				Checking", page 1152
sor 1		Choice of:				
		Nernst volt- age (VN) > 4.40 V				
		• Or				
		Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V				
		Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) < -2.35 V AG. Volkswa	gen AG does not guarantee or a			
	Var	ofksv O Perry	ornagdoes not gua			
	authoriseous	Diff. nernst voltage (VN)	adrantee or			
	(055°C	vs. virtual ground volt- age (VG) > 1.60 V	16	Cepranulia.		
odous, Snotoe		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) < -0.10 V		ility with respect to me	•	
		• Or		CC		
		• Pump current > 11.5 mA		ocuress of		
		• Or • Magaurament		infor		
Things or comme		O2S front label resistor not calibrated Ω		mation in this obc.y.		
3/	Pundos iupandos n	100	(q ₁ u ₀ u ₁ do ^O	·ingh		
	JAGUNAOO N	lerW	. DA nagewayen Volriging.			nosis and Testing
	-/1(Protected	. DA USBUNSAGU		3. Diag	nosis and Testing

De-Str	onitor ategy cription	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
sor Öper	sors S) Front n Cir- Nernst age	around valt	O2S front (linear) ready O2S ceramic temperature > 785° C For time >= 10.0 s	• 2.3 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking". page 1152 Ago The Converter Converter Catalytic Cata	taccatan liability with response

P2251 Oxy		old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure
O2 Sen Sen- (O2) sor Ope	sors S) Front en Cir- Virtual und	 Nernst voltage (VN) > 4.40 V Or Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground voltage (VG) < -2.35 V Or Diff. nernst voltage (VN) vs. virtual ground voltage (VN) vs. virtual ground voltage (VG) > 1.60 V Diff. nernst voltage (VN) vs. virtual ground voltage (VG) < 1.60 V Diff. nernst voltage (VN) vs. virtual ground voltage (VG) < -0.10 V 	 O2S front (linear) ready O2S ceramic temperature > 785° C For time >= 10.0 s 	• Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
	of vormmercial purposes, In part or in whole, is not being a part or in whole, is not been like.	 Or Pump current > 11.5 mA Or Measurement O2S front label resistor not calibrated Ω And Choice of: Diff. pump voltage (VIP) vs. virtual ground voltage (VG) <= 1.20 V Diff. nernst voltage (VN) vs. virtual ground voltage (VG) <= 1.20 V Or 		Des not guarante	of acceptant liability with respect to the control of the control	ne collectuess.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 1.20 V				
		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) > 1.20 V				
P2257 AIR Sys- tem Con- trol "A" Circuit Low	Secondary Air Injection (AIR) Pump Relay Short To Ground	• Output volt- age < 1.92 – 2.21 V	Engine running Actuator commanded off	0.5 s Continuous	• 2 DCY	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary
			adunies authorised by Vo			Air Injection Pump Relay J299 / Sec- ondary Air In- jection Pump Motor V101, Checking
P2258 AIR Sys- tem Con- trol "A" Circuit High	Secondary Air Injection (AIR) Pump Relay Short To Battery Plus	Or Output current > 1.0 – 2.0 Apadu (sessodund) > 1.0 – 2.0 Apadu (sessodund) > 1.0 – 2.0 Apadu (sessodund)		• 0.5 s • Continuous	• 2 DCY	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157.
		[Ki jo	PERMODO ORINADO INFONADO NO		.ĐAnags	J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
bo charger er/Su- per- charger pass Valve Me- chani-	charger By- pass (TCBY) Functional Check: Stuck Close	 Case 1: Integrated boost pressure deviation between PUT and filtered PUT n.a. kPa*s Case 2: Counter PUT crosses filtered PUT > 5.0 [-] Operational sequence for incrementing counter in case 2: 1.8L Positive difference between PUT and filtered PUT > 0.80 kPa 2.0L Positive difference between PUT and filtered PUT > 0.41 kPa After Negative difference between PUT and filtered PUT and filtered PUT (first count: only positive difference) < -2.0 kPa 	 External torque request not demanded IAT @ throttle > -11° C Barometric pressure > 73.0 kPa Intake overpressure protection not active Active turbocharger protection leading to opening of the waste gate not active Activations conditions: Recirculation actuator position set point 100.0% Time since last valve closed activation > 1,200 ms Gradient accelerator pedal value <= -97.70%/s Max boost pressure variation <= 50.0 kPa 	• 0.1 s land.	2 DCY 2 DCY - Lighth tespect to the correctness of information is	 Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249. Checking", page 1172. Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.

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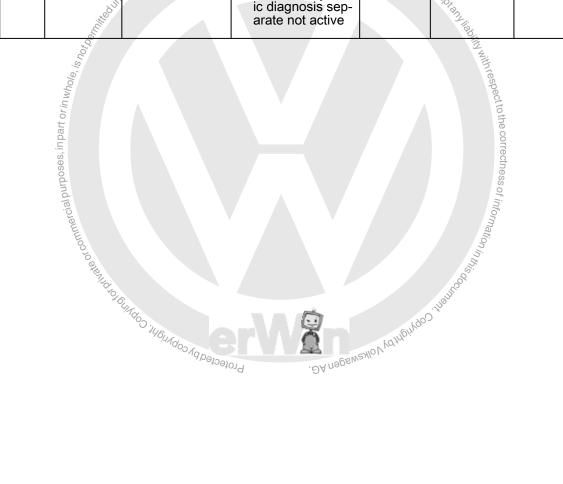
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Tur- bo- charg- er/Su- per-	Turbo-charger (TC) Position Sensor First adaptation Monitoring: Functional Check	No adaptation of boost pressure actuators sensor in actual driving cycle (no previous adaptation occurred) Reputation of boost pressure actuators sensor in actual driving cycle (no previous adaptation occurred) Reputation of the pressure of the pressure actuators sensor in actual driving cycle (no previous adaptation occurred)	start > 0.3 s Gen AG. Volkswagen AG do. Pressure up- stream throttle 0.00 – 543.40		• 2 DCY 2 DCY 2 DCY 2 CCaptanyliability with respect to the correctness of information in this could be a correctness of information in the correctness of in	 Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249 Checking", page 1172 Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .
	O to alenito It	Sternago inginago ya papa	BA nags	weaho V va Interven	On in the light of	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2270 O2 Sen- sor	Oxygen Sensors (O2S) Rear Signal Range Check	• Case 1: • Max. O2S rear voltage < 0.87 V • And • Oxygen load during peak max detection > 4.0 g • Or • Case 2: • Max. O2S rear voltage < 0.87 V • And • Oxygen load during peak max detection > 3.8 g • And • Counter in case of suspected Peak Max error > 5,000.0 [-]	 Conditions General conditions Vehicle speed >= 10 km/h BARO not calibrated kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S rear ready O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ and AG. Volksw. Time after engine start > 230.0 - 1,000.0 s 1.8L Engine speed 1,280 - 3,008 RPM 2.0L Engine speed 1,344 - 3,008 RPM Lambda control value < 50.0% Deviation of lambda controller output @ start diagrams. 	• 86.5 s • Once / DCY	• 2 DCY	dure - Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
		Copyright of the state of commercial purpose	lambda controller output during diagnosis < 8.0 – 15.0% Fast trim control not calibrated			Hormation in this oo
		10 0 140 140 140 140 140 140 140 140 140	Proportional part of secondary fuel control loop < 0.25 [-]	Wagewey	o V Va Meir V V V V V V V V V V V V V V V V V V V	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Coasting function not active			
			 Lambda adapta- tion not active 			
			 Valve lift not equipped 			
			Temperature conditions:			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) > -48° C			
			 Modeled catalyst temperature once after engine start > 550° C 			
			Modeled catalyst temperature @ start of diagnosis 500° C			
		esauthorised by V	Modeled catalyst temperature dur- ing diagnosis 470 – 730° C	AG does not guậ	rantee or an	
	Snor	in the state of th	 Modeled catalyst temperature @ start of diagnosis 500° C Modeled catalyst temperature during diagnosis 470 – 730° C Integrated air mass, catalyst temp. conditions fulfilled not calibrated g 		Cept and light	With the second
	, in part or <i>in whole</i> ,		 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 K 			with respect to the corre
	ormercial purposes	and the search of the search o	 Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K 			ctness of informatio
	,	ole did to	Modeled EGT @ O2S front <= 1,201° C		ing R	7.
		Search of Elikato Mating of States	Air mass conditions Air mass @ start of diagnosis 125.01 – 580.0 mg/stk	oy Volkewagen	hubingoo inse	ect to the correctness of $information$ is
			Air mass during diagnosis not calibrated mg/stk			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h			
			MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			
			Load conditions:			
			 Air mass set point 125.01 – 580.0 mg/stk 			
			Engine load not calibrated %			
			Accelerator pedal value not calibra- ted %			
			For time not cali- brated s			
			Low dynamic conditions			
		. AG	Dynamic engine speed < 20 RPM Volkswagen 4.6			
	7/4.	prised by Volkswageri Acc	Dynamic airs, not mass < 25.01 mg/, stk	arantee.		
	ikedunes saute		Dynamic lambda controller output <= 20.0%	or accept all	.	
whole:	S Polybern	nised by Volkswagen AG	 Low dynamic conditions Dynamic engine speed < 20 RPM Volkswagen < 25.01 mg/stk Dynamic airs mass < 25.01 mg/stk Dynamic lambda controller output <= 20.0% Integrated air mass after dynamic conditions are fulfilled > 20.0 g Evap purge conditions: Case 1 Evap purge valve not calibrated Case 2: Canister load calculation not calibrated Evap purge flow not calibrated Case 3: Canister load not calibrated [-] Evap purge flow not calibrated 		ablity with respect	
nerolal purposes, in part or in whole			Evap purge con- ditions: Case 1		tto the co	
ses, in p			Evap purge valve not calibrated		orrectne	
purp			• Case 2:		SS Of	
mercial			 Canister load cal- culation not cali- brated 		informatio,	
	ingle of c		Evap purge flow not calibrated		7 in this of	
	0,000		• Case 3:	ishing		
	YIA OOD ,	Protected by copyrigh	Canister load not calibrated [-]	THONKOO) IF		
		Protected by con				
			Close the gap conditions			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			O2S rear voltage @ diagnosis start >= 0.55 V			
		essauthorised by Volkswag	Antegrated air mass @ start di- agnosis not cali- brated g	not guarantee or		
	THE STATE OF THE S	2.0	O2S front dynamic diagnosis separate not active		ccepteny lieb;	



	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
1	O2 Sen- sor Signal Biase d/ Stuck Rich Bank I Sen- sor 2	Oxygen Sensors (O2S) Rear Signal Range Check	 Case 1: Min. O2S rear voltage > 0.25 V And Oxygen load during peak min detection > 2.6 g Or Case 2: Min. O2S rear voltage > 0.25 V And Oxygen load during peak min detection > 2.5 g And Counter in 	 BARO not calibrated kPa Catalyst overheating protection not active Turbine overheating protection not active 	• 86.5 s • Once / DCY	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.
or commercial purposes, In part or in whole, is hopport	A dinkess at	itorisedbyVolksw	case of sus- ager pected peak n A min error > 5,000.0 [-]	Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s 1.8L Engine speed 1,280 - 3,008 RPM 2.0L Engine speed 1,344 - 3,008 RPM Lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller output during diagnosis < 8.0 -	A liability with respect to the correctness of information in this oc		
	JOHA O	O TUBUNOO NO PORTO	Prote	 15.0% Fast trim control not calibrated Proportional part of trim control < 0.25 [-] 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Coasting function not active			
			Lambda adapta- tion not active			
			Valve lift not equipped			
			Temperature conditions			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) > -48° C			
			Modeled catalyst temperature once after engine start > 550° C			
			Modeled catalyst temperature @ start of diagnosis 500 – 700° C			
		loss authorised by Vol	Modeled catalyst temperature dur- ing diagnosis 470 – 730° C	a does not gua _{rã}	ntee or acc	
	is polye.		Modeled catalyst temperature @ start of diagnosis 500 – 700° C		Breta libility Mark	
	s, in part or in whole,		Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K			espect to the correc
	or commercial purposes, in part or		Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K		, o	tness of informati
	9	N. H.	Modeled EGT at O2S rear <= 1,201° C		inthis of the state of the stat	
		Salle of Bulledo intervedos val	namic and stationary catalyst temperature @ start of diagnosis -254.0 – 254.0 K Diff. between dynamic and stationary catalyst temperature during diagnosis -304.0 – 304.0 K Modeled EGT at O2S rear <= 1,201° C Air mass conditions Air mass @ start of diagnosis 125.01 – 580.0 mg/stk Air mass during diagnosis not calibrated mg/stk	MIDY VOIKSWAGE	hindoo jub	
			Air mass during diagnosis not calibrated mg/stk			

			Newagen AG. Volkswagen A	G _{does}	ocan 1001 - Ed	111011 12.2011
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring	MIL Illumina-	Component Diagnostic Procedure
		o di	MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h		RAJ labli	
	in whole, is		MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			hrespectic
	art o		Load conditions:			the
	or commercial purposes, in part or in whole, is hoto.		 kg/h MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time not calibrated % For time not calibrated s Low dynamic conditions Dynamic engine speed < 20 RPM Dynamic air mass < 25.01 mg/stk Dynamic lambda controller output < 20.0% 			correctness
	ercial pur		Engine load not calibrated %			s of infor
	or comm		Accelerator pedal value not calibra- ted %		"Inthis	n _{ati}
		MILATOLOGIA	For time not cali- brated s		illalingo	
		indo individuo	Low dynamic conditions	Yan	Gindo)	
		100/19	pont Dynamic engine Speed < 20 RPM	'A Olksmader		
			mass < 25.01 mg/ stk			
			Dynamic lambda controller output < 20.0%			
			Integrated air mass after dy- namic conditions are fulfilled > 20.0 g			
			Evap purge con- ditions:			
			• Case 1			
			Evap purge valve not calibrated			
			Case 2			
			Canister load cal- culation not cali- brated			
			Evap purge flow not calibrated			
			• Case 3			
			Canister load not calibrated [-]			
			Evap purge flow not calibrated			

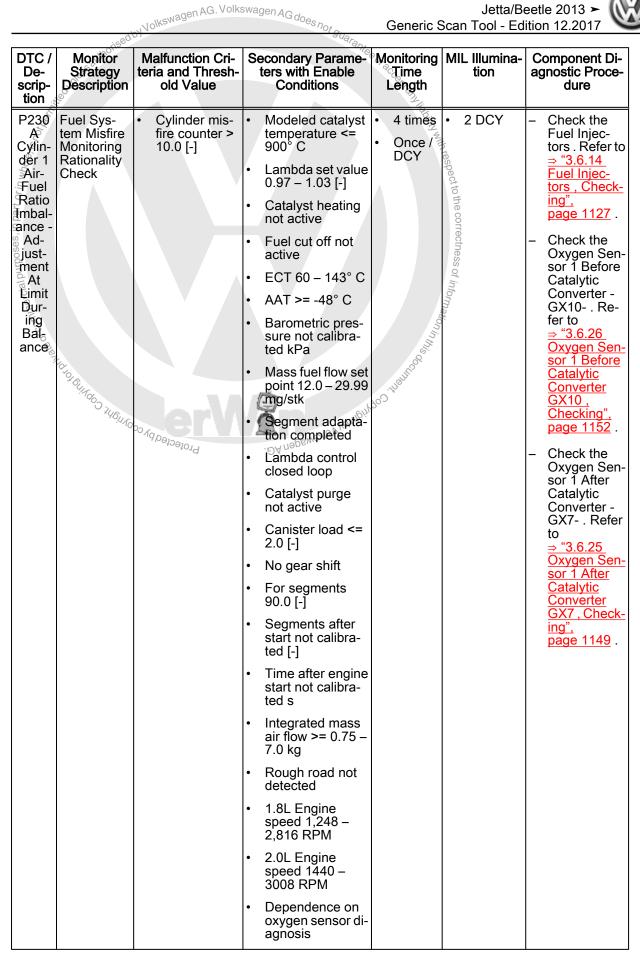
DTO / Manathan			1/6	
DTC / Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illumina- Time tion Length	Component Diagnostic Procedure
nercial purposes, in part or in whole, is not bey		 Close the gap conditions O2S rear voltage @ diagnosis start >= 0.55 V Integrated air mass @ start diagnosis not calibrated g O2S front dynam- 	Billid with respect to the correctness of informa	
P2279 Intake Air (IA) System Rationality Check C	Ratio adapted turbocharger boost pressure and actual turbocharger boost pressure > 35.0% Lambda conrection included controller and adaptation -50.0 – 50.0% Lambda controller active	ic diagnosis sep-	• 5.0 s • Continuous on Marken Market State Sta	- Check for air leaks near the throttle body, oil fill cap not tight or oil dipstick not seated in tube. Also check for any engine gaskets that can cause additional air to enter the crankcase can set this fault as the PCV system is not metered. If a vacuum leak or crankcase seal is the cause, the idle may be rough or unstable Check the Intake Manifold Sensor GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 - Refer to ⇒ "3.6.34 Throttle

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	rposes, in part or in whole, is not bemitted.	ing area correction included controller and adaptation > 50.0% • Lambda correction included controller and adaptation -28.0 – 28.0% • Lambda controller active	 Intake manifold modeled adaptation active (by throttle opening area) Throttle position 0.000 – 100.003° TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] AFast throttle o.27 – 0.60 [-] MAP gradient -200.0 – 200.0 kPa/s Fuel cut off not active Time after engine start > 5.0 s Turbo charger boost pressure < 135.0 kPa BARO 73.0 – 107.5 kPa Engine speed > 	not guarantee or	coat and liability with respect to the correctness	GX3, Checking", page 1169. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123.
P2300 Ignition Coil "A" Primary Control Circuit Low	Colls Short	in on state > 50 - 100 mA	51Ž RPM	Contin	• 2 DCY sof information in this country, and the country of the c	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2301 Ignition Coil "A" Primary Control Circuit High	Ignition Coils Short To Battery Plus		in Œmēgine stop not 5.28 5 cWve	0.8 s Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2302	Ignition	 Diagnosis_by_side switch in A Output temper ATIC in on stat 200.0° C Output current 100180 mA Output volt- 	mactive interspeed > ATIC512 RPM ature from the stop not e > active and AC. Volkswa AC. Volkswa Actuator comin ormstacted on	• 0.8 s	* 9 DCY	- Check the Ig-
Igni- tion Coil "A" Sec- on- dary Circuit	Coils Open Circuit	age in off state lower range = 1.92 – 2.21 V Output voltage in off state upper range <= 2.85 – 3.25 V (hardware values)	 51Ž RPM ECT @ cylinder block > -30° C Engine stop not active 	Continuous		nition Coils with Power Output Stage . Refer to 3.6.17 Ig- nition Coils With Power Output Stage . Checking", page 1133 .
P2303 Ignition Coil "B" Primary Control Circuit Low	Ignition Coils Short To Ground	Output current in on state > 50 – 100 mA Diagnosis_by_side switch in A	 Engine speed > 512 RPM ECT @ cylinder block > -30° C Engine stop not active 	• 0.8 s • Continuous	• 2 DCY • 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133
P2304 Ignition Coil "B" Primary Control Circuit High	Ignition Coils Short To Battery Plus	 Output voltage state > 4.95 - 8 (hardware value) Diagnosis_by_ side switch in A Output temper ATIC in on state 200.0° C 	in Obbrigine stop not 5.28 fct/ve es) Actuator commanded off Pacting intervspeed > ATIC512 RPM atur Entropine stop not	• O.8 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL IIIu Time Length	on agnostic Procedure
P2305 Ignition Coil "B" Secon- dary Circuit	Ignition Coils Open Circuit	 Output voltage in off state lower range >= 1.92 - 2.21 V Output voltage in off state upper range <= 2.85 - 3.25 V (hardware values) 	block > -30° C • Engine stop not active	0.8 sContinuous	CY — Check the Ignition Coils with Power Output Stage . Refer to — "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2306 Ignition Coil "C" Primary Control Circuit Low	Ignition Coils Short To Ground	Output current in on state > 50 – 100 mA Diagnosis by	512 RPM • ECT @ cylinder block > -30° C	• 0.8 s • Continuous • U2 D	nition Coils with Power Output Stage . Refer
P2307 Ignition Coil "C" Primary Control Circuit High	Ignition Coils Short To Battery Plus	Output voltage state > 4.95 - 4.	ATIC512 RPM in Official RPM 5.285ct/ve es) Actuator commanded off racting interspeed > ATIC512 RPM eture from stop not	• Continuous	CY - Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2308 Ignition Coil "C" Secondary Circuit	Ignition Coils Open Circuit	 Output voltage in off state lower range >= 1.92 - 2.21 V Output voltage in off state upper range <= 2.85 - 3.25 V (hardware values) 	 Engine speed > 512 RPM ECT @ cylinder block > -30° C Engine stop not active 	• 0.8 s • Continuous	CY - Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Igni- (Ignition of coils Short To Ground Industrial	Output current in on state > 50 - 100 mA Output current in On State > 700 mA Output current in Outp	512 RPM	• 0.8 s • Continuous		Check the Ignition Coils with Power Output Stage . Refer to 1.6.17 Ignition Coils With Power Output Stage . Checking". page 1133 .



		ithoris			, co		
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Sec te	condary Parame- ers with Enable Conditions	Time	MIL Illumina-	Component Diagnostic Procedure
	ole, is not		(Oxygen sensor dynamic diagno- sis finished n.a.		Aliability with respect to the correctness of information in this object.	
	or commercial purposes, in part or in whole, is not by the purposes.		(Oxygen sensor delay diagnosis finished n.a.		pect to the	
	in pa		• [Diagnosis at gear		corre	
	urposes		• t	1st gear not ac- tive		ctness o	
	mercial F			2nd gear not ac- tive		f informa	
	the or com		t	3nd gear not ac- tive		tion in this	
	MAL			4nd gear active		1000	
	9,	Sulfar	• !	5nd gear active		.Hgn.	
		3746W	• (6nd gear active	"IQIIVQO,	J	
		MADOD AG POISO	1	7nd gear active	, NOV VOTE		
		8411 ₁₀₀₀ 341611 ₁₀₀ 1491999	ા t	8nd gear not ac- tive			
			• [Limited dynamic conditions			
			• [Dynamic engine speed < 75 RPM			
			• [Dynamic MAF < 29.99 mg/stk			
			• [r	Dynamic torque request < 0.10 [-]			
			l	Dynamic window lambda control < 5.0 %			
			· [Dynamic ignition angle < 0.10 [-]			
				Additional condi- tions			
			i a	Cylinder balanc- ing diagnosis of all cylinders ac- tive			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P230 B Cylin- der 2	Fuel Sys- tem Misfire Monitoring Rationality	• Cylinder mis- fire counter > 10.0 [-]	Modeled catalyst temperature <= 900° C	4 timesOnce / DCY	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14
Air- Fuel	Check		 Lambda set value 0.97 – 1.03 [-] 			Fuel Injec- tors, Check-
Ratio Imbal- ance -			 Catalyst heating not active 			<u>ing",</u> page 1127 .
Ad- just-			 Fuel cut off not active 			- Check the Oxygen Sen-
ment At			• ECT 60 – 143° C	- >/ !!		sor 1 Before Catalytic
Limit Dur-			 ECT 60 – 143° C AAT >= -48° C Barometric pres- 	yagen AG. Volk	swagen AG does no	Converter - GX10 Re-
ing Bal- ance			Barometric pres- sure not calibra- ted kPa			fer to ⇒ 3.6.26 Oxygen Sen- sor 1 Before
		4	• Mass fuel flow set point 12.0 – 29.99 mg/stk		7	Catalytic Converter GX10,
		commercial purposes, in part or in whole, is ho	 Segment adaptation completed 			Checking", page 1152
			Lambda control closed loop			Check the Oxygen Sensor 1 After
			Catalyst purge not active			Catalytic Converter -
		urposes	• Canister load <= 2.0 [-]			GX7 Refer to ⇒ "3.6.25
		cial p	 No gear shift 			Oxygen Sen- sor 1 After
		commer	• For segments 90.0 [-]			Catalytic Converter
		The state of the s	Segments after start not calibrated [-]			GX7, Check- ing", page 1149
			Time after engine start not calibra- ted s			Valugiyego Jar
			• Integrated mass air flow >= 0.75 – 7.0 kg	₀₉ jo19	Kewagen AG.	page 1149 o
			 Rough road not detected 			
			 1.8L Engine speed 1,248 – 2,816 RPM 			
			 2.0L Engine speed 1440 – 3008 RPM 			
			 Dependence on oxygen sensor di- agnosis 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Oxygen sensor dynamic diagno- sis finished n.a. 			
		all the satisfaction of th	 Oxygen sensor dynamic diagnosis finished n.a. Oxygen sensor delay diagnosis finished n.a. Diagnosis at gear 1st gear not active 	en AG does not	gy _{ar}	
		authorise	Diagnosis at gear		"anteeor	
		ixedunless c	1st gear not active		accept 40	
		notbormi	2nd gear not active			ingollity wi
	, o4, n	18, 18	3nd gear not active			thresper
	orin		 4nd gear active 			cttotl
	part		 5nd gear active 			1e co
	ses, ir		6nd gear active			rrectr
	urpos		7nd gear active			less c
	glalp		 8nd gear not active 			of info
	3	rcomme	Limited dynamic conditions			mationin
		O STANDARD	 Dynamic engine speed < 75 RPM 		, KO	This of
		J. GUIAdo J. W.	 Dynamic MAF < 29.99 mg/stk 		enygo, ingir	highlity with respect to the correctness of information in this or
		40/1/A	• Dynamic torque ¬¬¬request < 0.10 [-]	Olkswagen AG.	Waring.	
			 Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque reguest < 0.10 [-] Dynamic window lambda control < 5.0 % 	.694		
			Dynamic ignition angle < 0.10 [-]			
			 Additional conditions 			
			 Cylinder balanc- ing diagnosis of all cylinders ac- tive 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh, old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	ommercial purposes, in part or in whole, is,	illi lines s	Oxygen sensor dynamic diagno- sis finished n.a.		*Cooperatus	
	(9,8)	1801	 Oxygen sensor delay diagnosis finished n.a. 			with respect to the correctness of information in the
	Who,		Diagnosis at gear			spect
	part or ir		1st gear not active			to the cc
	oses, in		 2nd gear not active 			orrectnes
	cial purp		 3nd gear not active 			ss of info
	nmer		 4nd gear active 	Y /		mat
			 5nd gear active 			Onlin
		of Bull	6nd gear active			7.
		0,10,10,1	 7nd gear active 		ightus	
		So of Reliated States of the State of the St	8nd gear not active		M. Copyigh	
		17/dos/	Limited dynamic conditions	A NOIKSWAGEN A	D/4	
			 Dynamic engine speed < 75 RPM 			
			 Dynamic MAF < 29.99 mg/stk 			
			 Dynamic torque request < 0.10 [-] 			
			 Dynamic window lambda control < 5.0 % 			
			Dynamic ignition angle < 0.10 [-]			
			 Additional conditions 			
			 Cylinder balanc- ing diagnosis of all cylinders ac- tive 			

DTC / Monitor Strategy scrip- tion
P230 D Cyth dontoring der 4 Air-Fuel Ratio Imbalance - Ad-Justment At Limit Durring Balance and Garden and Company

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Oxygen sensor dynamic diagno- sis finished n.a. Oxygen sensor delay diagnosis 			
			finished n.a.Diagnosis at gear			
			 1st gear not active 2nd gear not active 3nd gear not active 4nd gear active 5nd gear active 6nd gear active 7nd gear active 8nd gear active 8nd gear not active Limited dynamic conditions 			
		Julies authorised by Volks M	્રું ge 3nd ge ar not ac a ત	Des not gua.		
		authorises	 4nd gear active 	arante.	04	
		inlessia	 5nd gear active 		accep.	
		50	 6nd gear active 		1874	
	thorn,		 7nd gear active 		ability	
	ole, is no		 8nd gear not active 		withres	
	orin wh _e		Limited dynamic conditions		pectro	-
	commercial purposes, in part or in whole, is hold somitted.		 Dynamic engine speed < 75 RPM 			te correc
	ourpose		Dynamic MAF < 29.99 mg/stk			1000 1000 1000 1000 1000 1000 1000 100
	mercial		 Dynamic torque request < 0.10 [-] 		i information i	
	vare of com		 Dynamic window lambda control < 5.0 % 		tion in this c	
	140	O DUISC	 Dynamic ignition angle < 0.10 [-] 		. ingrituot	
		J. COPYFIGHT. CO.	Additional conditions	Wandhey Varient	PO, 2	
		O TOUR dos iya	 Dynamic window lambda control < 5.0 % Dynamic ignition angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active 	I OIKEMS		
P2310 Ignition Coil "D" Primary Control Circuit High	Ignition Coils Short To Battery Plus	side switch in A	nacEmeilteuspeed > ATIC512 RPM in OEngine stop not 5.285cWve	0.8 s Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 side switch in A Output tempers ATIC in on state 200.0° C 	etur Enforme stop not e > alctove – • Actuator come. Vol in om atated on ernal value	kswagen A G do	es not guarantes or	
P2311 Igni- tion Coil "D" Sec- on- dary Circuit	Ignition Coils Open Circuit	Output voltage in off state lower range >= 1.92 - 2.21 V Output voltage in off state upper range <= 2.85 - 3.25 V (hardware values)	 Engine speed > 512 RPM ECT @ cylinder block > -30° C Engine stop not active 	0.8 s Continuous	• 2 DCY	Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2400 EVAP Sys- tem Leak De- tec- tion Pump Con- trol Cir- cuit/ Open	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Open Circuit	age, lower range 1.92 – 2.21 V	Actuator commanded off Actuator commanded off Actuator commanded off	• 2.0 s • Continuous	• 2 DCY • 2 DCY • 2 DCY	- Check the Leak Detection Pump - V144 - Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking",
P2401 EVAP Sys- tem Leak De- tec- tion Pump Con- trol Circuit Low	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Ground	Output volt- age < 1.92 – 2.21 V (hard- ware values)	Actuator com- manded off	• 2:0 s of of other continuous	• 2 DCY	- Check the Leak Detec- tion Pump - V144 Refer to ⇒ "3.6.22 Leak Detec- tion Pump V144, Checking", page 1143.
P2402 EVAP System Leak Detection Pump Control Circuit High		perature > 160200° C • Or	Actuator com- manded on	2.0 sContinuous	• 2 DCY	- Check the Leak Detec- tion Pump - V144 Refer to ⇒ "3.6.22 Leak Detec- tion Pump V144, Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2407 EVAP System Leak Detection Pump Sense Circuit Intermittent/ Erratic	Evaporative Emission (EVAP) System Sig- nal Check	 Pump current oscillation > 1.5 mA And Number of aborted leak measurements due to pump current oscillations > 0.0 [-] 	Time after meas- urement start > 4.0 s (during ECM keep alive- time)	• 624.0 s • Once / DCY	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P240 A EVAP System Leak Detection Pump Heater Control Circuit/ Open	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Open Circuit	age lower range 1.85 –	Actuator commanded off Manded off AG. Volkswagen AG. Volksw	• 0.3 s • Continuous	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P240 B EVAP System Leak Detection Pump Heater Control Circuit Low	Evaporative Emission (EVAP) Leak Detection Pump (LDP) Short To Ground	Output volt- age < 1.85 – 2.28 V (hard- ware values)	Actuator com- manded off	Continuous	• 2 DCY	Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 Checking", page 1143 .
P240 C EVAP Sys- tem Leak De- tec- tion Pump Heat- er Con- trol Circuit High	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Battery Plus	Actuator temperature > 155 – 185° C Or Output current > 4.0 – 7.0 A	• Actnator commanded on	O.3 s Continuous Agrundation Agrundation Agrundation Agrundation Agrundation Agrundation	• 2 DCV	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 , Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2414 O2 Sen- sor Ex- haust Sam- ple Er- ror Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Front Rationality Check	Pump current correction > 1.2 mA (nernst-cell)	 O2S front ready Fuel cut off not active Injection mode change not active Depending on engine state: Engine part load Engine full load Engine idle For time >= 3.0 s 	• 10.0 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P2431 AIR System Air Flow/ Pressure Sensor Circuit Rang e/Perfor manc e Bank 1	Secondary Air Injection (AIR) Pres- sure Sensor Rationality Check	t or in whole, is not bermites				Sensor 2 - G610- Re- fer to ⇒ "3.6.30 Secondary Air Injection
		ortommercial purposes, i	Opposite of by Copyright: Copyright:		DA negsweylo V tay	Sensor 2 G610, Checking", page 1161.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2432 AIR System Air Flow/ Pressure Sensor Circuit Low	Secondary Air Injection (AIR) Pres- sure Sensor Out Of Range Low	• Sensor volt- age < 0.50 V		• 0.1 s • Continuous	• 2 DCY	- Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 , Checking", page 1165 .
Bank 1			Juniess authorised by Volkswage	n AG. Volkswag	en A G does not gua	- For Beetle, check the Secondary Air Injection Sensor 2 - G610 Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610 , Checking", page 1361 .
P2433 AIR System Air Flow/ Pressure Sensor Circuit High Bank	Secondary Air Injection (AIR) Pres- sure Sensor Out Of Range High	• Sensor voltage > 4.50°V age > 4.50°V age > 4.50°V age > 4.50°V age age age and on the sensor voltage age age age age age age age age age		0.1 sContinuous	• 2 DCY	- Check the Secondary Air System GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24 . Checking", page 1165 .
1		orcommercial)	O BUNDO HOUNTON HOUND TO THE PARTY OF THE PA		. DA nagewaylo V k	check the Secondary Air Injection Sensor 2 - G610 Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610, Checking", page 1161.

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
thole is not _{ber}	AIR Sys- tem Switc hing Valve Stuck Open Bank 1	Secondary Air Injection (AIR) Valve Functional Check	 1.8L Ratio relative pressure phase 1 and relative pressure phase 2 > 1.50 [-] 2.0L Ratio relative pressure phase 1 and relative pressure phase 2 > 1.30 [-] Time after measurement start > 2.0; < 2.5 s And 	 AIR pump active Catalyst heating active AIR active MAF 140.0 kg/h ECT @ cylinder block >= -10; < 115° C IAT @ manifold >= -10; < 100° C 	Once / DCY Once	• 2 DCY	 Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163 Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking",
or commercial purposes, in part or is	Valve Per- for- manc e/ Stuck	Evaporative Emission (EVAP) System Rationality Check	 Drop of evap pump current < 3.0 mA 	 Barometric pressure > 73.0 kPa AAT 4 – 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between EGT and AAT @ start not calibrated K propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) Airbag not activated 	• 0.5 score / DC Chess of Information in this oo.	• 2 DCY	page 1157. - Check the Leak Detection Pump - V144- Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
P2563 Tur- bo- charg- er Boost Con- trol Posi- tion Sen- sor "A" Circuit Rang e/Per- for- manc e	Turbo-charger (TC) Posi- tion Sensor Adaptation Monitoring: Functional Check	Boost pressure actuators sensor voltage > 4.52; < 2.73.	• Gradient of boost pressure >= -2.98%/s	O.3 ss no Continuous	• 2 DCY gualantee of acceptal	dure - Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 . Checking", page 1113 .
P2564 Tur- bo- charg- er Boost Con- trol Posi- tion Sen- sor "A" Circuit Low	Turbo- charger (TC) Posi- tion Sensor Short To Ground / Open Cir- cuit	Turbocharger boost control position sensor voltage < 0.20 V	Protected by Cop	• Continuous	· 2 DCY	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .
P2565 Turbocharger Boost Control Position Sensor "A" Circuit High	Turbo- charger (TC) Posi- tion Sensor Short To Battery Plus	Turbocharger boost control position sen- sor voltage > 4.80 V		• 0.5 s • Continuous	• 2 DCY	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .

-	Secondary Parame-	Monitoring	MIL Illumina-	Component I	Di-
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illumina- tion Length	Component Diagnostic Procedure
P2610 ECM/ PCM En- gine Off Timer Per- for- manc e	Time Rationality Check Check	Difference between engine-off time and ECM keep alive-time > 12.0 s 1.8L Difference between engine-off time and ECM keep alive-time >= 12.0 s 2.0L Difference between engine-off time and ECM keep alive-time >= 50.0 s	Conditions: ECM keep alive time active Delay time >= 1.0 s Last ECM activation time >= 2.0 s Time after last engine stop < 48 h Case 1: For time (after entry conditions fulfilled) >= 65.0 s Case 2: For time (after entry conditions fulfilled) < 65.0 s lgnition key transition off to on Time after engine stop < 86,400.0 s Engine off time plausible Engine off time monitoring not finished Engine off time signal valid	10.0 ms Once / DCY Once / DCY Once / DCY Min respect to the correctness of information in the co	- Check power and ground inputs to ECM first. Refer to appropriate wiring schematic for pin locations. If all powers/ grounds to ECM are present, replace the Engine Control Module - J623 Refer to appropriate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions		MIL Illumina- tion	Component Diagnostic Procedure
	Engine Off Time ECM Internal Timer Check	ECM internal timer failure ECM internal timer signal not calibrated ECM internal timer not calibrated Time after last engine stop not calibrated	• SPI initialisation	• 1.3 s • Continuous	es not gu _{arantes or}	agnostic Procedure
	COM: Fuel Pump Con- trol Module (FPCM) functional check: pump blocked	• Phase current 20 A • Phase current > 25 A	746 _{MA}	• 1.0 s • Continuous	• 2 DCY	Fuel Delivery Unit - GX1- / Fuel Pump Control Mod- ule - J538 Refer to = "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Mod-
P3044 Fuel Pump "A" Con- trol Circuit Low	COM: Fuel Pump Con- trol Module (FPCM) short circuit	• Phase current > 25 A	Profected by	• 1.0 such	• SV2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
Fuel Pump Elec- tron- ics	COM: Fuel Pump Con- trol Module (FPCM) functional check: elec- tronics	Internal check failed		• 1.0 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P3073 Fuel Pump "A" Con- trol Cir- cuit/ Open	Pump Con-	• Phase current < 0.8 A	_{WolksWagen} AG. Volkswag	• 1.0 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
P334 A Actua- tor Elec- trical Error	>	Bypass valve driver current>9.3 – 15.0 A	Boost pressure control active			Pressure Actuator V465. Checking", page 1113. - Check the Turbocharger Recirculation Valve - N249 Refer to 3.6.35 Turbocharger Recirculation Valve
U000 1 High Speed CAN Com- muni- cation Bus	CAN: Pow- ertrain BUS Reading Back Sent Message Powertrain	Message no feedback THELLAGE	• Time after ignition on 0.5 s	o.5 s Continuous	• 2 DCY pros	- Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
U000 2 High Speed CAN Com- muni- cation Bus Per- for- manc e	CAN: Pow- ertrain Bus Communi- cation Check	• Global time- out >= 0.4 s	• Time after ignition on >= 0.5 s	0.5 sContinuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U010 1 Lost Com- muni- cation with TCM	COM: Transmis- sion Control Module (TCM) Communi- cation With TCM	ous south of the state of the s	• Time after igni- tion on 0.5 s	• 1.0 s gen AG do continuo • Continuo uous	• 2 DCY Suarantee or acceptar	- Check the CAN-Bus terminal resistance between the Transmission Control Module and the Engine Control Module - J623 - Refer to "3:6.6 CAN-Bus Terminal Resistance, Powertrain, Checking", page 1112 .
U012 1 Lost Communication With Anti- Lock Brake System (ABS) Control Module	COM: Brake Sys- tem Control Module (BSCM) Communication With BSCM	Received message no message	• Time after ignition on >= 0.5 s	Continuous	· 2 DCY	- Check the CAN-Bus terminal resistance. Refer to "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
U014 0 Lost Com- muni- cation With Body Con- trol Mod- ule	COM: Body Control Module (BCM) Communi- cation With BCM	Received message no message	Time after ignition on 0.5 s	2.0 sContinuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109.
U014 6 Lost Com- muni- cation With Gate- way "A"	COM: Gate- way Com- munication With Gate- way	Received CAN mes- sage no mes- sage	Time after ignition on >= 0.5 s	0.5 sContinuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure	
U015 5 Lost Communication With Instrument Panel Cluster (IPC) Control Module	COM: In- strument Panel Clus- ter IPC Communi- cation With IPC	Received CAN mes- sage no mes- sage	Time after ignition on >= 0.5 s	• 0.5 s • Continuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109.	
U030 2 Soft-ware In- com- pati- bility With Trans- mis- sion Con- trol Mod- ule	Engine Control Module (ECM): Coding Code Check Of ECM Con- cerning TCM	Received AT vehicle data TCM signal	Time after ioni-	• Continuous	• 2 DCY	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module. Refer to appropriate repair manual.	atan liability with respect to
U032 3 Soft- ware In- com- pati- bility With Instru- ment Panel Con- trol Mod- ule	COM: Ambient Air Temperature (AAT) Sensor Communication With	Ambient temperature sensor: Source configuration failure	tion on > 1.2 s	• 1.0 s • Continuous	• 2 DCY	ment Cluster. Control Mod- ule - J285 Refer to ap- propriate re- pair manual.	- "HOFMakion in this Ookun
Data Re-	COM: Transmis- sion Control Module (TCM) Communi- cation With TCM	Received data from TCM im- plausible message	Time after ignition on 0.5 s	0.3 s Continuous	• 2 DCY	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module . Refer to appropriate repair manual.	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U041 5 Invalid Data Re-	COM: Vehi- cle Speed Sensor (VSS) Com- munication	Speed sensor signal: sensor error 327.42 km/h	Time after ignition on > 500.0 ms	0.5 sContinuous	• 2 DCY	Check the CAN-Bus terminal resistance. Refer to
ceived From Anti- Lock Brake	With VSS	Speed sensor signal: initiali- sation error 327.08 km/h				⇒ "3.6.5 CAN- Bus Terminal Resistance, Checking",
Sys- tem (ABS) Con- trol		Speed sensor signal: low voltage error 327.25 km/h				<u>page 1109</u> .
Mod- ule		Speed sensor signal: range error 326.40 – 327.07 km/h	_{olksw} agen AG. Volkswagen ,	AG does not		
		Speed sensor signal, range error 327.09 – 327.24 km/h		nor gu _a	antee of accepta	
	; is not	• Speed sensor signal: range error 327.26 – 327.41 km/h			Marie de la companya del companya de la companya de la companya del companya de la companya de l	Mith 16
	COM: ubart or in whole, is not tem Control	Speed sensor signal: range error 327.43 – 327.67 km/h				ith respect to the correctness of
	Module (BSCM) Community cation With BSCM	message	• Time after ignition on >= 0.5 s			orrectness of information
	Vehicle Speed Sen- sor (VSS) Rationality Check High	Vehicle speed > 325 km/h		2.0 sContinuous	in the strong of	
Data Re- ceived From	COM: In- strument Panel Clus- ter IPC Communi-	Received data from IPC im- plausible message	• Time after ignition on >= 0.5 s	• 0.5 s • Contin- uous	on 2 DCY	 Check for correct soft- ware version and VIN or update soft- ware for the IPC Module if
Instru- ment Panel Clus- ter Con- trol Mod- ule	COM: Ambient Air Temperature (AAT) Sensor Communication With AAT Sensor	Ambient air temperature signal failure	Time after ignition on > 0.5 s	• 0.6 s • Continuous		available. If OK, replace the Instrument Cluster Control Module - J285 Refer to appropriate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	COM: Ambient Air Temperature (AAT) Sensor Communication With IPC	Ambient tem- perature sen- sor: source in reset failure	 Time after ignition on > 1.2 s Engine running 	2.0 s Continuous Vagen AG does		
U044 7 Invalid Data Re- ceived From Gate- way "A"	COM: Gate- way Com- munication With Gate- way	Received data from gateway implausible message	Time after ignition on >= 0.5 s	• 0.5 s • Continuous	For 2, DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
	Engine Control Module (ECM): Pro-	Production mode active	 Vehicle speed < 5 km/h Max trip mileage since initial vehicle start-up < 100 km During ECM keep alive-time after ignition off Engine speed 0 RPM For hybrid: Drive motor off 	Continuous	.0	the first 100
		146)	Adop Ag papago	T Susus	10 V VO Might by Vol	the first 100 km (62.14 miles) of driv ing.

Engine Control Module, 2018 MY 3.4.5

Pond Variable Valve Tim- ing (VVT) Intake Acts that Position Slow Response Bank 1 Position Sensor - GA0 Refer to Position Sit timer >= 0.95 -4.0 s Position Sensor - GA0 Refer to Position Position	A Valve Timing (VVT) Intake Actuator Slow Response Set point change > 29.0° CRK Set point change > 29.0° CRK Dynamic diagnosis timer >= 0.95 -4.0 s A Valve Timing (VVT) Intake Actuator Slow Response Set point change > 29.0° CRK Dynamic diagnosis timer >= 0.95 -4.0 s Camshaft Adjustment Valve 1 N205. Refer to N206. Refer to N206. Response
Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.	Page 1121. Build of Directed by the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of the Man Sens Alov Will in the Control of

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
"A" Cam- shaft	Variable Valve Tim- ing (VVT) Intake Ac- tuator Open Circuit	 Output voltage lower range 1.92 – 2.21 V Output voltage upper range 2.85 – 3.25 V 	Actuator com- manded off	• 2.0 s • Continuous	• 2 DCY	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121.
Open Bank 1	worked by l	_{olksW} agen AG. Volkswa	gen AG does not guarante o			- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 . Checking". page 1107 .
Joseph Whole, is not be miled.	es fault.		gen AG does not guarantee or e	cedram liability with respection in a	9170 0 0 ct 4	- Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205., Checking", page 1105.
or commercial purposed	J. Elivero J. Helivero J.	Protected by	DA nagewealov vo morningo	information in this odd the state of the sta	These of	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
"A" V Cam- ir shaft Ir Posi- tu	Variable Valve Tim- ng (VVT) ntake Ac- uator Tar- get Error	al purposes, in part or in wh _r	Modeled oil temperature -40 – 160° C Engine speed 608 – 6,016 RPM Camshaft position not calibrated Camshaft position adjustment active Catalyst heating not active Camshaft position deviation integrator (actual vs. set point position) >= 9.0 – 12.0° CRK*s		olkswagen AG do ₆	Engine Speed Sensor G28, Checking", page 1121. - Check the Camshaft Position Sensor - G40 Refer to = "3.6.4 Camshaft Position Sensor G40, Checking", page 1107. - Check the Camshaft Adjustment Valve 1 - N205 Refer to = "3.6.3 Camshaft Adjustment Valve 1 N205 Refer to 3.6.3 Camshaft Adjustment Adjustment Camshaft Adjustment Camshaft Adjustment Camshaft Camshaft Adjustment Camshaft Camshaft

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0016 Crank shaft Posi- tion - Cam- shaft Posi- tion Corre- lation Bank 1 Sen- sor A	Position (CMP/CKP) Intake Sen- sor Adapta- tion Value Monitoring	Adapted value for each edge of the target wheel < -14.0° CRK Adapted value for each edge of the target wheel > 14.0° CRK CRK CRK Adapted value for each edge of the target wheel > 14.0° CRK	tion adaptation (exhaust side) active • Engine speed 288 – 4,000 RPM • Modeled oil temperature >= -15° C • Modeled oil temperature <= 160° C • Diff. actual exhaust camshaft position vs. previous camshaft po-	T20.0° CRK Multiple **Nice Oracle Diameter Color Color CRK Multiple Multiple Mult	• 2 DCY	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121 Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205, Checking", page 1105.
			Engine stopped			

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	or accept and light
P0030 HO2S Heat- er Con- trol Circuit Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Heat- er Front Open Cir- cuit	O2S front heater voltage lower range 1.92 – 2.21 V O2S front heater voltage upper range 2.85 – 3.25 V	commercial purposes, in part or in whole, is nog	2.5 sContinuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.	ot accept am liability with respect to the correctness of information in this ook little little of the correctness of information in this ook little little of the correctness of information in this ook little little of the correctness of information in this ook little little of the correctness of information in this ook little little of the correctness of information in this ook little little little little of the correctness of information in this ook little l
P0031 H02S Heat- er Con- trol Circuit Low Bank 1 Sen- sor 1	Sensors (O2S) Heat- er Front Short To Ground	O2S front heater voltage < 1.92 – 2.21 V	TO TO THE REAL PROPERTY OF THE PARTY OF THE	• 2.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26" Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.	Modo in the Hologonia.
P0032 H02S Heat- er Con- trol Circuit High Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Heat- er Front Short To Battery Plus	160.0 – 200.0° C	 Modeled EGT @ O2S front >= -273° C Actuator commanded on 	• 2.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.	
P0033 Tur- bo- charg- er/Su- per- charg- er By- pass Valve "A" Con- trol Circuit	tuator Open Circuit	 Voltage lower range 1.92 – 2.21 V Voltage upper range 2.85 – 3.25 V 	Actuator commanded off manded off	• 1.0 s • Continuous	• 2 DCY	- Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249, Checking", page 1172. - Check the Actuator - V465 Refer to ⇒ "3.6.7	

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure			
	Turbo- charger (TC) Com- pressor Ac- tuator Short To Battery Plus	 Current > 4.0 7.0 A Temperature 160 - 200° C 	Actuator com- manded on			Charge Air Pressure Ac- tuator V465, Checking", page 1113.			
Tur- bo- charg-	tuator Short To Ground	• Voltage < 1.92 – 2.21 V	manded off	• 1.0 s • Continuous	• 2 DCY	- Check the Turbocharg- er Recircula- tion Valve - N249 Refer to ⇒ "3.6.35 Turbocharg- er Recircula- tion Valve N249, Checking", page 1172. - Check the Actuator -			
			akilika lunke sauthorise d	y Volkswagen A	G. Volkswagen A(Actuator - do V465 Refer to do	Cepter Control of the		
HO2S Heat- er	Oxygen Sensors (O2S) Heat- er Rear Open Cir- cuit	 O2S rear heater voltage lower range 1.92 – 2.21 V O2S rear heater voltage upper range 2.85 – 3.25 V 			• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149 .	lity with respect to the correctness of information.		
	P0036 Oxygen HO2S Sensors Heater voltage lower range or Rear Open Circuit Bank 1 Sensor 2 P0036 Oxygen HO2S Sensors Sensors (O2S) Heater Pack (O2S) Heater Pack (O2S) Heater Pack (O2S) Heater Pack (O2S) Heater Open Circuit Bank 1 Sensor 2 P0036 Oxygen Sensors Heater voltage lower range of Rear Open Circuit Bank 1 Sensor 2 P0036 Oxygen Sensors Heater voltage lower range of Rear Open Circuit Sensor 1 After Catalytic Converter GX7 - Refer to S								
				9	3. Diagi	nosis and Testing 7	71		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0037 HO2S Heat- er Con- trol Circuit Low Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Heat- er Rear Short To Ground	O2S rear heater voltage < 1.92 – 2.21 V V Annual Research of the search of the	Engine not in start process Aby Volkswagen AG. Volkswagen AG	 2.5 s Continuous agen AG does no 	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking". page 1149.
	Sensors (O2S) Heat- er Rear Short To Battery Plus	heater driver temperature > 160.0 – 200.0° C O2S rear heater driver output current > 8.0 – 12.0 A	 Modeled EGT @ O2S rear >= 300° C Actuator commanded on Engine not in start process 	2.5 sContinuous	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "36.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking". page 1149
Tur- bo- charg-	Turbo- charger (TC) Boost Pressure	Bypass valve driver load resistances 200.0 kΩ	 Deviation between actual and filtered boost pressure actuator position <= 5.0% Boost pressure control not active Time delay > 1.0 s 	O.4 s Continuous • O.4 s	• 2 DCY	8

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
MAP/ MAF - Throt- tle Po- sition Corre- lation	Manifold Absolute Pressure (MAP) Sensor Large Leakage Detection	Diff. MAP set point vs. actual MAP < -15.010.0 kPa	 Fast throttle adaptation finished MAP gradient -200.0 – 200.0 kPa/s Vehicle speed <= 2 km/h Time after engine start > 5.0 s Engine speed lower range > 576 RPM Engine speed upper range < 3,000 RPM IAT @ manifold > -48° C ~~ Signal (tco) > -48° C Pressure quotient @ throttle 0.10 – 0.60 [-] Load dynamic conditions: Dynamic engine speed < 8,160° no RPM Dynamic air mass < 25.01 mg/ stk 	• 5.0 s • Continuous • Quarante o o race o	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169. - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake Air (IA) System Rationality Check	Throttle opening area correction included controller and adaptation < -60.0% Lambda controller included correction and adaptation -28.0 – 28.0% Lambda controller active	modeled adaptation active (by throttle opening area) Throttle position 0.0 – 100.003° TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] Fast throttle adaptation finished MAP gradient -200.0 – 200.0 kPa/s Fuel cut off not active Time after engine start > 5.0 s Turbocharger boost pressure	guarān _{to}		
Ambient Air Temperature Sensor Circuit "A"	bient Air Tempera- ture (AAT) Sensor Short To Battery / Open Cir- cuit	AAT sensor voltage > 4.50 V		• 2.0 s	• 2 DCY 2 DCY 2	- Check the Outside Air Temperature Sensor - G17- Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148 Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109 .
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POOT 1 Ambient Air Ambi-Tempera- ent Air ture (AAT) Tem—Sensor pera- Cross ture Check Sensor sor Circuit "A" Rang ef/Per enranc e	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	P0071 Ambient Air Temperature Sensor Circuit "A" Rang e/Performanc	Temperature (AAT) Sensor Cross Check	erence measuring Diff. AAT @ cold start vs. IAT @ manifold @ cold start vs. ECT downstream engine @ cold start not calibrated K Diff. AAT @ cold start not calibrated K Diff. AAT @ cold start vs. ECT @ radiator outlet @ cold start vs. ECT @ radiator outlet @ cold start vs. AAT @	 = 360.0 min Engine off time plausible Time after engine start < 6,553.5 s Depending on temperature slope @ cold start: Diff. actual IAT @ manifold vs. IAT @ manifold ws. IAT @ manifold @ start of DCY < 256.0 K Diff. actual ECT downstream engine ws. ECT downstream engine ws. ECT downstream engine @ start of DCY not calibrated K Diff. actual ECT @ radiator outlet ws. ECT @ radiator outlet vs. ECT @ radiator outlet vs. ECT @ radiator outlet ws. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Por time >= 0.1 s Depending on mean value condition Mean value of all temperature sensors @ cold start >= -256° C Number of valid sensors >= 2.0 [-] Depending on block heater / solar radiation detection Time after engine start >= 0.5 s Vehicle speed >= 20 km/h For time >= 20.0 s Diff. actual IAT @ manifold vs. min. 	• Once / DCY		Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148 . - Check the CAN-Bus terminal re- sistance. Re- fer to

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Diff. actual ECT downstream en- gine vs. min. ECT downstream en- gine not calibra- ted K 			
			Diff. actual AAT vs. min. AAT < 4.5 K AAA Volkswagen a			
		dunkés authorised by Volks	vs. min. AAT < 4.5 K Diff. actual ECT @ radiator outlet vs. min. ECT @ radiator outlet < 4.5 K	does not guarani	Reor Ricello	
Ambi- ent Air	COM: Ambient Air Temperature (AAF) Sensor Short To Ground	voltage < 0.10		2.0 sContinuous	• 2 DC lability with resp.	- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148 .
	commercial purp					Check the CAN-Bus terminal resistance. Refer to
		TO TO THOUNGOO KA PO		G	Kido jilalikok liji	3.6.5 CAN- Bus Terminal Resistance, Checking", page 1109
		1011Adoo Aqpo	DA na	PEWZHOV KOTHO		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0087 Fuel Rail/ Sys- tem Pres- sure - Too Low Bank 1	Fuel Rail Pressure (FRP) Out Of Range Low Fuel Rail Pressure (FRP) Rail Pressure (FRP) Rationality	 Deviation between reference fuel pressure set point and current fuel pressure > 2,000.10 kPa Case 1:	 General: Engine speed 608 – 6,816 RPM Fuel mass set point 15.01 – 1,389.0 mg/stk. Accident > 5.0 s Engine warm-up not calibrated Catalyst heating not active Full load not calibrated Catalyst purge not calibrated Lambda control not calibrated Lambda control not calibrated Evap purge functionality diagnosis not calibrated Fuel pressure set point gradient <= 200.06 kPa Depending on low dynamic conditions: Fuel mass set point lower range > 1.99 mg/stk Fuel mass set point upper range < 100.32 – 172.41 mg/stk Fuel mass set point gradient 1380 0 2 20 			G247 Refer to ### 13.6.16 Fuel Pressure Sensor G247, Checking*.
	Check Low	 tation -50.0 – 50.0% High pressure controller output > 35.0 mg Deviation between fuel pressure set point and current fuel pressure > 2,000.10 kPa Fuel pressure < 2,500.0 kPa 	mg/stk			- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .

Too High Bank 1 Deviation lambda of controller included adaptation -50.0 − 50.0% Case 1: High pressure controller output < -30.0 mg Case 2: Flow control valve open Mass fuel flow set point > 15.01 mg/stk Time after engine start > 5.0 s Engine warm-up not calibrated Catalyst heating not active Full load not calibrated Catalyst purge not calibrated Catalyst purge not calibrated Lambda control not calibrated Evap purge functionality diagnossis not calibrated Fuel pressure set point y and calibrated Fuel pressure set point gradient <= 200.06 kPa Personance Regulating Valve - 200.06 kPa Controller included adaptation -50.0 s Engine warm-up not calibrated Catalyst heating not active Fuel load not calibrated Catalyst purge not calibrated Evap purge functionality diagnossis not calibrated Fuel pressure set point gradient <= 200.06 kPa	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
• Evap purge valve not calibrated [-]	P0088 Fuel Rail/ Sys- tem Pres- sure - Too High Bank 1	Fuel Rail Pressure (FRP) Out Of Range High	Deviation between fuel pressure set point and current fuel pressure < -2,000.10 kPa Deviation lambda of controller included adaptation -50.0 – 50.0% Case 1: High pressure controller output < -30.0 mg Case 2: Flow control valve open Mass fuel flow set point > 15.01 mg/stk	 General: Engine speed 608 – 6,816 RPM Fuel mass set point 15.01 – 1,389.0 mg/stk Time after engine start > 5.0 s Engine warm-up not calibrated Catalyst heating not active Full load not calibrated Catalyst purge not calibrated Lambda control not calibrated Lambda control not calibrated Evap purge functionality diagnosis not calibrated Fuel pressure set point gradient <= 200.06 kPa AG. Volkswagen AG of low dynamic conditions: Fuel mass set 	• 5.0 s • Continuous	or accept and liability with respective	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 13 and/or to appropriate repair manual. Check the Fuel Pressure Sensor G247 . Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 . Checking". page 1131 . Check the Fuel Pressure Regulating Valve - N276 . Refer to ⇒ "3.6.15 Fuel Pressure Regulating Valve - N276 . Checking". page 1129 .
440		17.6	O. C. LIIA	Evap purge valve not calibrated [-]		405 judinos	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Fuel Pres-	Fuel Vol- ume Regu- lator Con- trol Open Circuit	 Voltage high side < 1.87 - 2.26 V Low and high side on: Moreover the side < 12.2 - 15.0 A current high side < 13.5 - 16.5 A 	Actuator commanded on	O.2 s Continuous en AG. Volkswa	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538. Testing page 1125. - Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276. Checking". page 1129.
Fuel Pres- sure Regu-	Fuel Volume Regulator Control Short To Ground (High Side) Fuel Volume Regulator Control Short To Ground (Low Side)	• Voltage low side < 1.87 – 2.26 V	Ignition on Ignition off (during ECM keep alive-time) Actuator commanded on Ignition off (during ECM keep alive-time) Actuator commanded off	• 0.2 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- Fuel Pump Control Mod- ule - J538- Refer to 3.6.13

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Fuel Pres- sure Regu- lator 1 Con- trol	Fuel Vol- ume Regu- lator Con- trol Short To Battery Plus (Low Side)	• Current low side > 13.5 – 17.0 A	 Ignition on Ignition off (during ECM keep alive-time) Actuator commanded on 	• 0.2 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13
Circuit High	Fuel Vol- ume Regu- lator Con- trol Short To Battery Plus (High Side)	Voltage high side < 2.78 – 3.33 V	Ignition on Ignition off (during ECM keep alive-time) Actuator commanded off			Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125. - Check the Fuel Pressure Regulator Valve - N276 - Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking",
P00A F Tur- bo- charg- er/Su- per- charg- er Boost Con- trol	Turbo- charger (TC) Boost Pressure Control Functional Check - Transient Check	Boost pressure actuator position controller output > 98.0% Boost pressure actuator position controller output < -98.0%	 Time after engine start >= 4.0 s ECT > -40° C AAT > -40° C Catalyst heating not active Boost pressure 	• Contin- uous	• 2 DCY	*************************************
"A" Mod- ule Per- for- manc e	Turbo- charger (TC) Boost Pressure Control Functional Check	Deviation boost pressure actuator position controller > 16.0 – 100.0%	 Time after engine start >= 4.0 s ECT > -40° C AAT > -40° C Boost pressure control active 			to the correctness of inform
		mos to alendro to indo	AAT > -40° C Boost pressure control active AGE AGE AGE AGE AGE AGE AGE A	yen A.G.	вмэмо Лацбілао	Pressure Actuator V465, Checking", page 1113.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Manifold Absolute Pressure/ Baro-metric Pressure Sensor Circuit Range/ Formance e	Manifold Absolute Pressure (MAP) Sensor Engine Standing: Cross Check	Case 2: non charged engine Diff. BARO mean value vs. MAP mean value not calibrated kPa Diff. deviation BARO mean value (MAP mean value, BARO mean value, BAR	 Case A: engine stop during DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle not calibrated For time >= 10.0 s Case B: engine stop @ start of DCY Vehicle speed < 1 km/h Engine @ driving cycle not calibrated 	• 3.0 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169. - Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115. - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139.

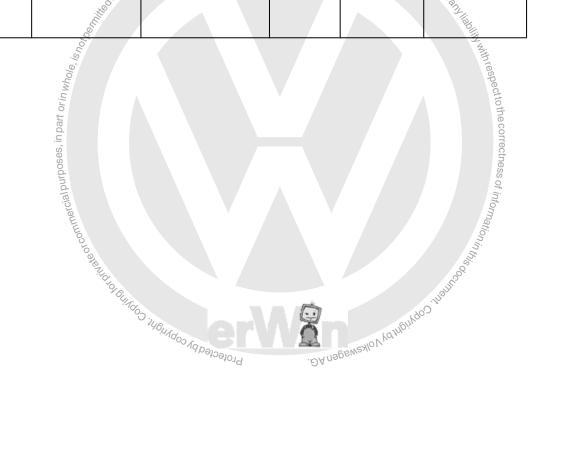
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
		Diff. BARO mean value vs. MAP mean value not calibrated kPa					
	Manifold Absolute Pressure (MAP) Sen- sor ECM Keep Alive- Time: Cross Check	 Case 1: Charged engine Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure <= 7.50 kPa Diff. turbocharger boost pressure vs. MAP > 7.50 kPa Case 2: Non charged engine Diff. BARO mean value @ ECM keep alive vs. MAP mean value not calibrated kPa 	 Engine stopped Vehicle speed < 1 km/h ECM keep alive time 10.0 – 6,553.5 s Time after engine stop >= 5.0 s BARO sensor voltage 0.20 – 4.80 V MAP sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V Intake manifold modeled adaptation active (by throttle opening area) 	AG. Volkswag∈	n AG does not guar	Antee or accept and like life	
	Intake Air (IA) System Rationality Check	tion 440.0% • Lambda controller included correction and adaptation > 28.0%	 Throttle position 0.0 – 100.003° TPS Engine speed 576 – 3,008 RPM 			With respect to the second Information in this object.	ae correctne

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Throttle opening area correction included controller and adaptation > 40.0% Lambda controller included correction and adaptation < -28.0%	Time after engine start > 5.0 s Turbocharger boost pressure < 135.0 kPa BARO 73.0 – 107.50 kPa Turbocharger boost pressure < 135.0 kPa BARO 73.0 – 107.50 kPa Turbocharger boost pressure < 135.0 kPa Turbocharger boost pressure < 135.0 kPa Turbocharger boost pressure < 135.0 kPa	an AG. Volkswa	gen AG does not gu	at antice of accept and liability with respect to the
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	OCHCIIC OC	an 1001 - Edition 12	2.2017	90.	John does not	γ.
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Mani- fold	Manifold Absolute Pressure (MAP) Sen- sor Circuit Low	Intake manifold pressure sensor volted age < 0.20/04/Mulant or in Mart or in	Rudologingdos inginados Valbersei	• 0.5 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 - Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169. - Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31 - Checking", page 1115. - Check the Intake Manifold Sensor - GX9 - Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9 - Checking", page 1139. - Check the EVAP Canister Purge Regulator Valve 1 - N80 - Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80 - Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80 - Checking", page 1123 .

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0108 Manifold Absolute Pressure/ Barometric Pressure Sensor Circuit High	Manifold Absolute Pressure (MAP) Sen- sor Circuit High	Intake manifold pressure sensor voltage > 4.80 V	_{strorised} by Volkswagen AG. V	0.5 s Continuous olkswagen AG	• 2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 .



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake Air Tempera- ture (IAT) Sensor @ Manifold Cross Check	 High side: reference measuring Diff. IAT @ manifold @ cold start vs. AAT @ cold start > 20.0 K Diff. IAT @ manifold @ cold start vs. ECT downstream engine @ cold start not calibrated K Diff. IAT @ manifold @ cold start vs. ECT @ radiator outlet @ cold start > cold	 = 360.0 min Engine off time plausible Time after engine start < 6,553.5 s Depending on temperature slope @ cold start: Diff. actual IAT @ manifold vs. IAT @ manifold ws. IAT @ manifold @ start of DCY < 256.0 K Diff. actual ECT downstream engine vs. ECT downstream engine @ start of 	• 0.1 s • Once / DCY	• 2 DCY	- Check the Intake Manifold Sensor - GX9- Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking". page 1139 - Check the Charge Air Pressure Sensor - G31- Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115
	in Dart	Min. amount of faulty reference measurements to detect defective sensor 2.0 [-] Low side: reference measuring Diff. AAT @ cold start vs. IAT @ manifold @ cold start vs. IAT @ manifold @ cold start > 20.0 K Diff. ECT downstream engine @ cold start vs. IAT @ manifold @ cold start vs. IAT @ cold start vs. IAT @ manifold @ cold start vs. IAT @ manifold @ cold start vs. IAT @ cold start >	DCY not calibrated K Diff. actual ECT actual ECT actual ECT actual ECT actual ECT actual ECT	igen AG does no	A guarante e or actelor	



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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Min. amount of faulty reference measurements to detect defective sensor 2.0 [-]	 Diff. actual ECT downstream engine vs. min. ECT downstream engine not calibrated K Diff. actual AAT vs. min. AAT < 4.5 K Diff. actual ECT @ radiator outlet vs. min. ECT @ radiator outlet < 4.5 K 	bility with respect to the correctness of information		
Intake Air Tem-	Tempera- ture (IAT) Sensor Short To	• IAT sensor voltage < 0.10 V	Mewagen, Markgoningo, Ingri	• 2.0 s	• 2 DCY	 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115
		• IAT sensor voltage > 4.50 V		 2.0 s Continuous 	• 2 DCY	- Check the Intake Manifold Sensor - GX9- Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. - Check the Charge Air Pressure Sensor - G31- Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115.
	P0112 Intake Air Temperature Sensor 1 Circuit Low Bank 1 P0113 Intake Air Temperature Sensor 1 Circuit Low Bank 1	P0112 Intake Air Temperature (IAT) Sensor 1 Circuit Low Bank 1 P0113 Intake Air Temperature (IAT) Sensor 9 Short To Ground Sensor 1 Circuit Low Bank 1 P0113 Intake Air Temperature (IAT) Sensor 9 Cound Sensor 1 Circuit High Bank	P0112 Intake Air Temperature (IAT) Sensor 1 Circuit Low Bank 1 P0113 Intake Air Temperature (IAT) Sensor 1 Circuit Low Bank 1 P0113 Intake Air Temperature (IAT) Sensor 0 Open Circuit Circuit High Bank 1 P0113 Intake Air Temperature (IAT) Sensor 0 Open Circuit Sensor 1 Circuit Low Bank 1	Strategy Description Term Description	Description Strategy cription Image: Condition conditions conditions Image: Conditions condition	Strategy Description Strategy Description Descri

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Ene giool and the second properties of the sec	authorised by	stream engine @ engine	 Cross checks finished Engine running Engine off time >= 240.0 min Valid AAT signal for time >= 2.0 s Valid engine stop signal for time >= 3.0 s 	• 1.0 s • Once / DCY	• 2 DCY	 Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117 . Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119 .
		Difference be- tween maxi- mum and min- imum temper- ature of ECT downstream engine < 2° C Nolkswagen AG. Volkswagen AG. AG. Volkswagen AG.	engine > -256° C • IAT @ throttle -48 – 143° C			
			ECT downstream engine <= 82° C ECT downstream engine >= 98° C Engine running			
			 Engine part load Engine full load Engine speed > 1,300 RPM Vehicle speed >= 50 km/h 			
			 For time >= 30.0 - 60.0 s Engine idle 			
	20.		 Vehicle speed < 255 km/h Fuel cut off active Engine stop For time >= 30.0 - 60.0 s 	in the state of th	of inform	
	Roger TUBUNG	Protectedby	• Time after engine start > 100.0 s	20 .ingn,		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina-	Component Diagnostic Procedure
	Engine Coolant Tempera- ture (ECT) Sensor Down- stream En- gine Ration- ality Check Inappropri- ately Low	Diff. min temperature of cross check sensors vs. ECT downstream engine @ engine start >= 10° C	Cross checks finished			Recept any liability with respect to the correctness of information in this cock the
	Engine Coolant Tempera- ture (ECT) Sensor Down- stream En- gine Ration- ality Check Low	Difference be- tween model- led and meas- ured ECT downstream engine tem- perature > 10 K	 ECT downstream engine -128 – 127° C Time after engine start > 60.0 s 	10.0 sContinuous		orrectness of information in this
P0117 En- gine Cool- ant Tem- pera- ture Sen- sor 1 Circuit Low	Engine Coolant Tempera- ture (ECT) Sensor Down- stream En- gine Short To Ground	ECT sensor voltage down- stream engine < 0.30 V	Protected by copyright; of	• 0.5 s • Continuous	· 2 DCY	Engine Cool-
						- Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83 . Checking", page 1119 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0118 En- gine Cool- ant Tem- pera- ture Sen- sor 1 Circuit High	Engine Coolant Tempera- ture (ECT) Sensor Down- stream En- gine Short To Battery / Open Cir- cuit	ECT sensor voltage down- stream engine > 4.90 V	 IAT @ throttle >= -33° C Time after engine start > 60.0 s 	Contin-	• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor - G62 Refer to ⇒ "3.6.9 En- gine Coolant Temperature Sensor G62, Checking", page 1117 Check the
			unless authorised by Volkswa	gen AG. Volksw	agen AG does nof	Engine Cool- ant Temper- ature Sensor on Radiator Outlet - G83 Refer
Throt- tle/	sor (TPS) 1 Rationality Check	Normalised difference between measured and modeled value of mass air flow from TPS 1 > 1 > 1 > 1 > 1 > 1 > 1 > 1 > 1 > 1	Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) not active	• 0.01 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .
Throt- tle/	sor (TPS) 1 Short To Ground / Open Cir- cuit	Throttle position sensor 1 voltage < 0.17 V	Authol Cilldo Mairdoo Vaboloo	• 0.2 s • Continuous	• 2 DCA	- Check the Throttle Valve Control Module - GX3 Refer 3.6.34 Throttle Valve Control Module GX3 , Checking", page 1169 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Throt- tle/ Pedal	sor (TPS) 1 Short To Battery Plus	Throttle posi- tion sensor 1 voltage > 4.83 V	Volkswagen AG does not gu	*CC80*	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169
Volt-	Oxygen Sensors (O2S) Front Short To Ground	O2S sensor voltage < 0.15 V	Engine running	• 0.5 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
P0132 O2 Sen- sor Circuit High Volt- age Bank 1 Sen- sor 1	Sensors (O2S) Front Short To	O2S sensor voltage > 5.20 – 5.35 کی ایمان	• Engine running	1/0:	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0133 Oxygen Sensors (O2S) From Dynamic Path Response Check 1 Sensor 1	Average check Mean value of normalised signal amplitude >= 1.0 [-] Ratio check Ratio of failed diagnostic cycle not calibrated [-]	General conditions: Time after engine start >= 0.0 s ECT >= -48° C Vehicle speed >= 0 km/h Integrated air mass after gear change 0.0 g MAF 0.0 − 1,389.0 mg/stk Integrated air mass per cylinder >= 0.0 kg Static conditions: O2S front ready Lambda stimulation active	Ojecjed by Copy		AG Check the Oxygen Sensor 1 Before Catalytic Converter GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
De- scrip-	Strategy Description	teria and Threshold Value old Value	 ters with Enable Conditions Dynamic MAF per segment < 30.0 kg/h Dynamic lambda not calibrated % Change of dynamic torque < 0.07 [-] Conditions range 2: (Diagnosis carried out together with the catalyst efficiency diagnosis) General conditions Vehicle speed >= 10 km/h BARO >= 0.0 kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S heater rear active 	Time Length	tion	agnostic Procedure
			- 3,008 RPM • Lambda control value < 50.0%			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Paramenters with Enable Conditions	Monitoring Time Con Length	MIL Illumina- tion	Component Diagnostic Procedure
		illo di de la compania di della compania di dell	Deviation of lambda controller output @ start di- agnosis < 10.0%		S OF RC	SOF BALLING
		Old Aalde Commercial purposes, in part or in whole, is not being the part of the whole, is not being the part of t	Deviation of lambda controller output during di- agnosis < 8.0 – 15.0%			exern liability with respect to the correctness of information in this cocurage.
		part or	Fast trim control not calibrated) the cor
		lal purposes, ii	Proportional part of secondary fuel control loop < 0.25 [-]			rectness of in
		ommerc	Coasting function not active			ormation
		Ologieni	Lambda adapta- tion not active			nin this oc
		Q _{IOI} OIIXO	Valve lift not equipped		.5	auro
		70 74	Temperature conditions:		WO VESTABINGOS	
			• ~~ Signal (tmot) > 60° C	. DA nagen	(3)NC,	
			• ~~ Signal (tans) > -48° C			
			Modeled catalyst temperature once after engine start > 550° C			
			Modeled catalyst temperature @ start of diagnosis 500 – 700° C			
			Modeled catalyst temperature dur- ing diagnosis 470 – 730° C			
			Integrated air mass, catalyst temperature con- ditions fulfilled not calibrated g			
			Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure
		anitidunas authorised by V	Diff. between dynamic and stationary catalystem temperature during diagnosis -304.0 – 304.0 K Modeled EGT @ O2S rear <= 1,201° C Air mass conditions:	AG does not gue	rantee or	
		iii dulless o	Modeled EGT @ O2S rear <= 1,201° C		accept and list	
	S	©Q.	 Air mass conditions: 			With
	rt or in whole, ,		 Air mass conditions: Air mass @ start of diagnosis 125.01 – 580.0 mg/stk Air mass during diagnosis not calibrated mg/stk MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time >= 0.0 s Low dynamic 			respect to the
	poses, in pa		 Air mass during diagnosis not calibrated mg/stk 			correctnes
	ommercial pur		 MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h 			s of informatio
	,	O BEAUTO OF THE WAS TH	 MAF per cylinder during diagnosis 35.0 – 135.0 kg/h 		LE OR	7 <i>i</i> ;
		JOHN CO.	Load conditions:		Tright, Co.	
		JADINYOOV	• Air mass set point 125.01 – 580.0 mg/stk	ON VOIKSWAYOV VO	h Monyage	
			Engine load not calibrated %	1000-		
			 Accelerator pedal value not calibra- ted % 			
			• For time >= 0.0 s			
			 Low dynamic conditions: 			
			 Dynamic engine speed < 20 RPM 			
			 Dynamic air mass < 25.01 mg/ stk 			
			Dynamic lambda controller output < 20.0%			
			 Integrated air mass after dy- namic conditions are fulfilled > 20.0 g 			
			 Evap purge con- ditions: 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Mile Illumina- tion	Component Diagnostic Procedure	
tion		s. commercial purposes, in part or in whole, is not	 Case 1 Evap purge valve not calibrated Case 2 Canister load calculation not calibrated Evap purge valve not calibrated Case 3 Canister load not calibrated [-] Evap purge valve not calibrated Close the gap conditions: O2S rear voltage @diagnosis start >= 0.55 V Integrated air mass to start diagnosis >= 0.0 g O2S front dynamic diagnosis sep- 	pejorq	. DA negewey	O NATURANDO THE THE TOTAL OF THE	itty with response

Oxygens (O2S) Front Delay Path-Response (Check Path Response Check Path Response Path		DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Canister load known Canister purge not calibrated Moving mean val-	commercial purposes, in part or in whole, is not be.	scription	Oxygen Sensors (O2S) Front Delay Path [©] Response Check	Normalised lambda con- lage troller value vs. modeled lambda value >= 1.0 [-]	Conditions General conditions General conditions Cas front ready Time after engine start >= 0.0 s MAF to activate diagnosis function 0.0 mg/stk Integrated air mass per cylinder >= 0.42 - 2.0 kg Vehicle speed >= 0 km/h Static condition Engine speed 1,056 - 3,008 RPM MAF per cylinder 15.0 - 150.0 kg/h Vehicle speed >= 0 km/h Dynamic conditions Dynamic conditions Dynamic torque < 288 RPM Dynamic torque < 380.0 Nm Absolute dynamic MAF < 70.0 kg/h Activation due to canister purge Canister purge Canister purge Canister purge Canister purge Mar = 100.0 kg/h Canister purge Canister purge Canister purge Canister purge Canister purge Canister purge Mar = 100.0 kg/h Canister purge Canister purge	Length	tion	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
O2 Sen- sor Heat-	Oxygen Sensors (O2S) Heat- er Front Functional Check	• O2S ceramic temp. < 730° C	• For time ≥ ± 10.0 s	20.0 s agen AG. Volks Contin- uous	• 2 DCY wagen AG does no	- Check the Oxygen Sen- sor 1 Before Catalytic Converter - GX10-, Re- fer to ⇒ "3.6.26 Oxygen Sen- sor 1 Before Catalytic Converter GX10, Checking", page 1152.
P0137 O2 Sen- sor Circuit Low Volt- age Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Rear Short To Ground	O2S sensor voltage < 0.15 V V O2S sensor voltage < 0.15 V V	O2S heater ac- tive	• 0.6 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
P0138 O2 Sen- sor Circuit High Volt- age Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Rear Short To Battery	O2S sensor voltage > 5.2 – 5.35 V	le (175 heater ac-	• 0.5 s • Contin- duous	IKEWSGEN P.G.	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149



O2 (O2S) Rear 1,000.0 mV/s (arithmetic average) • Vehicle speed >= 10 km/h • Vehicle speed >= 10 km/h • BARO >= 0.0 kPa • Catalyst overheating protection not active • Turbine over-	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	agnostic Proce- dure
Fast trim control not calibrated Proportional part of secondary fuel	P013 A O2 Sen- sor Slow Re-	Oxygen Sensors (O2S) Rear Rich To Lean Tran- sition Re- sponse	• Gradient sensor voltage < 1,000.0 mV/s (arithmetic average)	 Conditions General conditions Vehicle speed >= 10 km/h BARO >= 0.0 kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S rear ready O2S front ready Internal resistance O2S rear active O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s For 1.8L: Engine speed 1,280 - 3,008 RPM For 2.0L: Engine speed 1,344 - 3,008 RPM Lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller output @ start diagnosis < 8.0 - 15.0% Fast trim control not calibrated Proportional part 	Length • 86.5 s • Once / DCY	• 2 DC	dure

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Coasting function not active			
			 Lambda adapta- tion not active 			
			 Valve lift not equipped 			
			Number of checks 2.0 [-]			
			Temperature conditions:			
			 ~~ Signal (tmot) > 60° C 			
	400	Volkswagen AG. Volksw	•geদেন্ত Signal (tans) > -48° Cিংন _{েই পুর} ে			
	Junes sauthorise of		 Modeled catalyst temperature once after engine start > 550° C 	Taccop _r		
Ne, is notbernifi			Modeled catalyst temperature @ start of diagnosis 500 – 700° C	Laccaptan libolity with rest		
patt orinwh _o			 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 	7	C.	
mercial purprises			 Number of checks 2.0 [-] Temperature conditions: ~ Signal (tmot) > 60° C Signal (tans) > -48° C not support to the perature once after engine start > 550° C Modeled catalyst temperature @ start of diagnosis 500 - 700° C Modeled catalyst temperature during diagnosis 470 - 730° C Integrated air mass, catalyst temp. conditions fulfilled not calibrated g 		to the correctness of inf	
ommo to arening.	900		 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 K 	mation in this cook where the		
	TO BURDOS HONDOS	Protected by	Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K	pî î		
			 Modeled EGT @ O2S rear <= 1,201° C 			
			Air mass conditions:			
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/stk 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Air mass during diagnosis not calibrated mg/stk			
			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h			
		iced by Volkswa	MAF per cylinder during diagnosis 35.0 – 135.0 kg/h	es not guara		
		authoris	Load conditions:	antee	Dr	
	William State of the State of t	diess	 Air mass set point 125.01 – 580.0 mg/stk 		*Cceptanuliab.	
	isnoto		Engine load not calibrated %		III WITH	
	or in whole		Accelerator pedal value not calibra- ted %		espect to t	
	part		• For time >= 0.0 s		Ve co	
	oses, in		Low dynamic conditions:		ll echies	
	rcial purp		Dynamic engine speed < 20 RPM		sof info	
	or commer		Dynamic air mass < 25.01 mg/ stk		mation in th	
	New York	Di Olingo	Dynamic lambda controller output < 20.0%		-inghing st.	
		OS 1461Ados Aqpais	 MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time >= 0.0 s Low dynamic conditions: Dynamic engine speed < 20 RPM Dynamic air mass < 25.01 mg/stk Dynamic lambda controller output < 20.0% Integrated air mass after dynamic conditions are fulfilled > 20.0° g 	Wesho Volksw	2,7	
			Evap purge con- ditions:			
			• Case 1			
			Evap purge valve not calibrated			
			• Case 2			
			Canister load cal- culation not cali- brated			
			Evap purge flow not calibrated			
			• Case 3			
			Canister load not calibrated [-]			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion Component Di- agnostic Proce- dure
	1/8, 10		 Evap purge flow not calibrated 		Withres
	orinwh		 Close the gap conditions: 		pectto t
	ses, in part		 O2S rear voltage @ diagnosis start >= 0.55 V 		ne correctn
	omercial purposes, in part or in whole		 Integrated air mass @ start di- agnosis >= 0.0 g 		with respect to the correctness of information in the
	,	60,00	 O2S front dynamic diagnosis separate not active 		mation in this
		APPERING STABINGOS	Protected by	DA negswexlo V _V	OINBINGO TRAINGO A

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure						
P013 B O2	Oxygen Sensors (O2S)_Rear	• Gradient sen- sor voltage < 650.0 mV/s	General conditionsVehicle speed >=	86.5 sOnce / DCY	• 2 DCY	 Check the Oxygen Sen- sor 1 After 						
Sen- sor Slow	Lean To Rich Transi- tion Re-	(arithmetic average)		(arithmetic average)	average)	average)	àverage)	10 km/h BARO >= 0.0 kPa	DC1		Catalytic Converter - GX7 Refer	
Re- spons e -	sponse Check							Catalyst over- heating protection not active Turbine over-	gen AG. Volksv	vagen AG does	to <u>⇒ "3.6.25</u> Oxygen Sen-	
to Rich	n h										tion not active Turbine over- heating protec-	
Bank 1 Sen- sor 2		heating protec- tion not active O2S rear ready			ing", %, page 1149.							
	notber	O2S heater rear active			ab little							
		nole, is	O2S front ready									
	eor commercial purposes, in part or in whole, is horbe	• Internal resist- ance O2S rear <= 700.0 Ω	V									
		Time after a catalyst purge phase >= 0.02 s										
			• Integrated heat energy >= 1,600.0 – 3,000.0 kJ			TO THE THE OLD STATE OF THE THE OLD STATE OF THE OLD STATE OLD STATE OF THE OLD STATE OF THE OLD STATE OF THE OLD STATE OF TH						
				• Time after engine start > 230.0 – 1,000.0 s		Sino Or						
			• For 1.8L: Engine speed 1,280 – 3,008 RPM	erW		Markeingo Jan						
			• For 2.0L: Engine and speed 1,344 – 3,008 RPM	DA Nagen AG.								
			Lambda control value < 50.0%									
			Deviation of lambda controller output @ start di- agnosis < 10.0%									
					Deviation of lambda controller output during di- agnosis < 8.0 – 15.0%							
									Fast trim control not calibrated			
					Proportional part of secondary fuel control loop < 0.25 [-]							

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Coasting function not active 			
			 Lambda adapta- tion not active 			
			 Valve lift not equipped 			
			Number of checks 2.0 [-]			
			Temperature conditions:			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) >	100		
		nless authorised by Volks	 Modeled catalyst temperature once after engine start > 550° C 	oes not guarante	20, aco	
	S not bernitt	811	 ~ Signal (tmot) > 60° C ~ Signal (tans) > 20		O'AM HIBBILLY MILE	
	rt or in whole, _{ie}		 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 		n respect	et to the
	ul purposes, in pa		 Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g 			correctness of L
	wate or commercif	Bunges authorized by Volks	 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 K 		"Ormation in this obe,	
		Of BUILDO HOUNDOOND POR	 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 – 254.0 K Diff. between dynamic and stationary catalyst temperature during diagnosis -304.0 – 304.0 K Modeled EGT @ O2S rear <= 1,201° C 	виемо V V от пр	900 ingh	
			 Modeled EGT @ O2S rear <= 1,201° C 			
			Air mass conditions:			
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/stk 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions • Air mass during diagnosis not calibrated mg/stk • MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h • MAF per cylinder during diagnosis 35.0 – 135.0 kg/h • Load conditions: • Air mass set point 125.01 – 580.0 mg/stk • Engine load not calibrated % • Accelerator pedal value not calibrated % • For time >= 0.0 s • Low dynamics conditions: • Dynamic engine speed < 20 RPM • Dynamic air mass < 25.01 mg/stk • Dynamic tambda controller output < 20.0%	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Air mass during diagnosis not calibrated mg/stk MAF per cylinder	wagen AG does	not guara	
		sdundes author	calibrated mg/stk MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 mg/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time >= 0.0 s Low dynamics conditions: Dynamic engine speed < 20 RPM Dynamic air mass < 25.01 mg/stk Dynamic tambda controller output < 20.0% Integrated air mass after dynamic conditions		Antee or acce	о _г ,
		Will Wood hours	MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			N liability with
		0/6, /6	 Load conditions: 			nres
		art or in wh	 Air mass set point 125.01 – 580.0 mg/stk 			pect to the c
		dui,ses,in b	 Engine load not calibrated % 			correctne
		rcial purpo	Accelerator pedal value not calibra- ted %			ss of info
		mmel	• For time >= 0.0 s	, , ,		mati
		nate of col	Low dynamics conditions:			on in this
		World Collection	 Dynamic engine speed < 20 RPM 	-	1,125	JILO O
		300 341	• Dynamic air mass < 25.01 mg/	A See Margar	PAIO V VO INDINGO, 2	
			Dynamic tambda controller output < 20.0%	-DA napo		
			 Integrated air mass after dy- namic conditions are fulfilled > 20.0 g 			
			 Evap purge con- ditions: 			
			Case 1			
			 Evap purge valve not calibrated 			
			Case 2			
			 Canister load cal- culation not cali- brated 			
			 Evap purge flow not calibrated 			
			• Case 3			
			 Canister load not calibrated [-] 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
			Evap purge flow not calibrated				
			Close the gap conditions:				
			O2S rear voltage @ diagnosis start >= 0.55 V				
			Integrated air mass @ start di- agnosis >= 0.0 g				
			O2S front dynamic diagnosis separate not active	orised by Volksw	agen AG. Volkswa	gen AG does not gu _{arar}	b.
			arate not active	WBIAdoo Aqpais	Seloid	DA nogewagen AG.	decepted library with respect to the correctness of information in this och the correctness of information in the correctness of information in the correctness of the correctn

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure																																																	
	Oxygen Sensors (O2S) Rear Rich To Lean Tran- sition De- layed Re-	Sensor signal delay time > 0.9 s (arith- metic aver- age)	 General conditions Vehicle speed >= 10 km/h BARO >= 0.0 kPa 	• 86.5 s • Once / DCY	• 2 DCY	 Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer to 																																																	
e -	sponse Monitoring, Delay Measure- ment		 Catalyst overheating protection not active Turbine overheating protection 			⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Check-																																																	
Bank 1 Sen-			tion not activeO2S rear ready			<u>ing",</u> page 1149 .																																																	
sor 2			O2S heater rear active	gen AC	a. Volkswagen 40	,																																																	
			O2S front ready	Volkswagern	31111	goes not guara																																																	
		 heating protection not active O2S rear ready O2S heater rear active O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase ≥= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s For 1.8L: Engine speed 1,280 - 3,008 RPM For 2.0L: Engine speed 1,344 - 3,008 RPM Lambda control value ≤ 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller Deviation of lambda controller 											• Internal resist- ance O2S rear <= 700.0 Ω			"Antee or acc																																							
						W lightlitt																																																	
							• olintegrated heat energy >= 1,600.0 – 3,000.0 kJ																																																
																		Time after engine start > 230.0 – 1,000.0 s																																					
			For 1.8L: Engine speed 1,280 – 3,008 RPM																																																				
			• For 2.0L: Engine speed 1,344 – 3,008 RPM				This																																																
			Lambda control value ≤ 50.0%			.,4	TILOOK																																																
																																																		lambda controll output @ start o agnosis < 10.00	Deviation of lambda controller output @ start dia agnosis < 10.0%	Protected by	»AAns	ремежо V V и териорической в териорической в териорической в териорической в териорической в териорической в т	
			Deviation of lambda controller output during di- agnosis < 8.0 – 15.0%	7																																																			
			Fast trim control not calibrated																																																				
			Proportional part of secondary fuel control loop < 0.25 [-]																																																				

DTC /	Monitor	Malfunction Cri-	Secondary Parame-	Monitoring	MIL Illumina-	Component Di-
De- scrip- tion	Strategy Description	teria and Thresh- old Value	ters with Enable Conditions	Time Length	tion	agnostic Proce- dure
			Coasting function not active			
			Lambda adapta- tion not active			
			Valve lift not equipped			
			Number of checks 2.0 [-]			
			Temperature conditions:			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) > -48° C			
			Modeled catalyst temperature once after engine start > 550° C			
			Modeled catalyst temperature @ start of diagnosis 500 – 700° C			
		yoy Volkswagen AG. Voll	Modeled catalyst temperature dur- swaing diagnosis 470 - 730° C ^S not			
	ited unless authorise		Modeled catalyst temperature dur- swaing diagnosis 470	Se Or accept		
orin whole, is not be			Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K		with respect to the	
ial purposes, in part			after engine start > 550° C • Modeled catalyst temperature @ start of diagnosis 500 – 700° C • Modeled catalyst temperature during diagnosis 470 – 730° C not guardiagnosis 470 – 254.0 K • Diff. between dynamic and stationary catalyst temperature @ start of diagnosis 4754.0 – 254.0 K • Diff. between dynamic and stationary catalyst temperature during diagnosis 4304.0 – 304.0 K • Modeled EGT @ O2S rear <= 1,201° C • Air mass @ start of diagnosis 425.01 – 580.0 mg/stk	Man Andrew Con Man Con Man Con Man Con Man Con Con Con Con Con Con Con Con Con Co	₁e correctness of in≀	
or commercial			Modeled EGT @ O2S rear <= 1,201° C	J. J	ormation.	
**	Middo		Air mass conditions:	iliooliy		
	3.00 JA0A	oo _{oo} g erV	Air mass @ start of diagnosis 125.01 – 580.0 mg/stk	Kgo, ingan		
	L	1 NO120101	- Magaway	L	L	l .

Profe

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL	Illumina- tion	Component Diagnostic Procedure
	Ornition of the state of the st			Air mass during diagnosis not calibrated mg/stk	POT PAR I I BUIL			
Whole, is.	Med to the state of the state o			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h	the dility with respect to the correctness of information in this object.			
ın part or <i>in</i>				 MAF per cylinder during diagnosis 35.0 – 135.0 kg/h 	t to the corr			
oses,				Load conditions:	ectne			
ercial purp				 Air mass set point 125.01 – 580.0 mg/stk 	ss of inforn			
Mu	orcon			Engine load not calibrated %	nation in t			
	STENIA TO TO			Accelerator pedal value not calibra- ted %	Silico			
		(A0/0) 11/10		For time >= 0.0 s				
		indoo ya	Plotected	Low dynamics conditions: Dynamic engine				
			,7	speed < 20 RPM				
				Dynamic air mass < 25.01 mg/ stk				
				Dynamic lambda controller output < 20.0%				
				Integrated air mass after dy- namic conditions are fulfilled > 20.0 g				
				Evap purge con- ditions:				
				Case 1				
				Evap purge valve not calibrated				
				Case 2				
				Canister load cal- culation not cali- brated				
				Evap purge flow not calibrated				
				• Case 3				
				Canister load not calibrated [-]				

			· · · · · · · · · · · · · · · · · · ·			·
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	tion	Component Diagnostic Procedure
			Evap purge flow not calibrated Close the gap conditions:	wagen AG doe	not guarant	
		adunks sauthol	O2S rear voltage @ diagnosis start >= 0.55 V		Mee or acce	0 ₁ ,
		Snotosmilie	Integrated air mass @ start di- agnosis >= 0.0 g			A lightlity with
		or in whole, i	O2S front dynamic diagnosis separate not active			respecttott
		Copyright of the specific of t	Protected by copyrig	.ĐAnsgsw	Copyrghtby Volks	du d

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
seot commercial purposes, in part o	sor De- layed Re- spons e - Lean to Rich Bank 1 Sen- sor 2	Oxygen Sensors (O2S) Rear (O2S) Rear Lean To Rich Transi- tion De- layed Re- sponse Monitoring, Delay Measure- ment	0.9 s (arithmetic average)	 General conditions Vehicle speed >= 10 km/h BARO >= 0.0 kPa Catalyst overheating protection not active Turbine overheating protection not active O2S rear ready O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ For 1.8L: Engine speed 1,280 - 3,008 RPM For 2.0L: Engine speed 1,344 - 3,008 RPM For 2.0L: Engine speed 1,344 - 3,008 RPM Lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller output during diagnosis < 8.0 - 15.0% Fast trim control not calibrated Proportional part of secondary fuel control loop < 0.25 [-] 		• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking" page 1149 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Coasting function not active			
			 Lambda adapta- tion not active 			
			 Valve lift not equipped 			
			 Number of checks 2.0 [-] 			
			 Temperature conditions: 			
			 ~~ Signal (tmot) > 60° C 			
		uagen AG. V	 ~~ Signal (tans) > olksw48°nC_{G does} Modeled catalyst 			
	less authori	sed by Volkswas	Modeled catalyst temperature once after engine start > 550° C	an _{tee or ecceptedulic}		
,00%			Modeled catalyst temperature @ start of diagnosis 500 – 700° C	Diana		
t orin whole, is			 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 		n respect to the	
purposes, inpar			 Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g 		correctness of	
commercial	6 alamid	_{Sed by} Volkewagen AG. V	 Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 K 		information in the	
	*018415d00 7416	Protected by copyright	 Modeled Catalyst temperature @ start of diagnosis 500 – 700° C Modeled catalyst temperature during diagnosis 470 – 730° C Integrated air mass, catalyst temp. conditions fulfilled not calibrated g Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 – 254.0 K Diff. between dynamic and stationary catalyst temperature during diagnosis -304.0 K Modeled EGT @ O2S rear <= 1,201° C 	Ginggo Jagur.		
			 Modeled EGT @ O2S rear <= 1,201° C 			
			Air mass conditions:			
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/stk 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Air mass during diagnosis not calibrated mg/stk			
			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h			
			MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			
			Load conditions:			
			 Air mass set point 125.01 – 580.0 mg/stk 			
			Engine load not calibrated %			
			Accelerator pedal value not calibra- ted %			
			• For time >= 0.0 s			
			Low dynamics conditions:			
		odby Volkswagen A	Speed < 20 RPM	942.		
	1111855	uthorisee	Dynamic air mass < 25.01 mg/ stk	Arantee or accep	Dx	
	Silling of to	uhojisedby Volkswagen /	Dynamic lambda controller output < 20.0%	gu _{arantee oracce}	en lightitu	
	or In whole, is n		 Integrated air mass after dynamic conditions are fulfilled > 20.0 g Evap purge conditions: Case 1 Evap purge valve not calibrated Case 2 Canister load calculation not calibrated Evap purge flow not calibrated Case 3 Canister load not calibrated [-] 		_{vith} respect to the	
			Evap purge con- ditions:		correct	
9	Sod II		• Case 1		ness (
	ercialpu		Evap purge valve not calibrated		of Inform	
	Comm		Case 2		ation,	
	to aranid to	Protected by copyright, O	 Canister load cal- culation not cali- brated 		in this of cut	
	Dillad	346 _{US}	Evap purge flow not calibrated	Jugir Copyright		
		CODICODIA CODIA	• Case 3	Vidia		
		, atold	calibrated [-]			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Evap purge flow not calibrated Close the gap conditions: 			
			O2S rear voltage @ diagnosis start >= 0.55 V Integrated air.			
			 Integrated air mass @ start di- agnosis >= 0.0 g 			
			O2S front dynamic diagnosis separate not active			
O2 Sen- sor	Oxygen Sensors (O2S) Rear Open Cir- cuit	• Internal resist- ance of O2S (binary) > 65,534.0 Ω	A.C. Volkewa	2.5 sContinuous	• 2 DCY	- Check the Oxygen Sen- sor 1 After Catalytic Converter - GX7 Refer
ty De- tected Bank 1 Sen- sor 2		sitilis dukes sauthorised	oyVolkswagen AG. Volkswa	yen AG does no _i	Quarantee or acceptal	⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking". page 1149
P0141 O2 Sen- sor Heat- er Cir- cuit Bank 1 Sen- sor 2	in par	• Internal resistance of O2S (binary) 700.0 – 65,534.0 Ω	 Actuator commanded on For time >= 10.0 s 	• 20.0 s • Once / DCY	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 - Refer to Samuel Sensor 1 After Catalytic Converter GX7 , Checking", page 1149
	Fuel Injection Valve Supply Voltage Out Of Range Low	• Boost voltage <= 50.0 V • Boost voltage < 30.0 V	• Engine running >= 0.3 s	3.6 sContinuous	· 2 DCY	Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Check-
	Fuel Injec- tion Valve Supply Volt- age Out Of Range High	Boost voltage > 75.0 V	Protected by co.	Olkswagen AG.	Varin.	ing", page 1127 .

Fuel System Too tem Too tem Too dosed loop I Air mass > 60.0 mg/stk Engine speed > 576 RPM For 1.8L: — Signal (tco) > 50° C IAT @ manifold > 48° C AAT > 48° C Evap purge valve closed Canister load <= 1.20 [-] Canister load <= 1.20 [-] Lower limit of lambda controller output not call-brated Upper limit of lambda controller output not call-brated Upper limit of lambda controller output not call-brated Upper limit of lambda controller output not call-brated Evap purge flow at min. value Evap purge flow at min. value Too tem System mechanical testing in a 3.1 Presimanary. Check the Fuel Press sure Sensor G247. Refer to a 3.6.14. Check the Fuel Injectors. Refer to a 3.6.14. Check the Coxygen Sensor of After Catalytic Converter GXY. Refer to a 3.6.24. Check the Coxygen Sensor of After Catalytic Converter GXY. Refer to a 3.6.24. Check the Coxygen Sensor of After Catalytic Converter GXY. Refer to a 3.6.24. Check the Coxygen Sensor of After Catalytic Converter GXY. Refer to a 3.6.24. Check the Coxygen Sensor of After Catalytic Converter GXY. Refer to a 3.6.24. Cover Sensor of After Catalytic Converter GXY. Check to GXY. Check and CXY. Che

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
				C. Volkewoos		- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking", page 1152.
		part orin whole, is not bernite out.	es authorised by Volkswagen A	G. Volkswagen	AG does not guaran	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module's J538 Refer to ⇒ "3.6.3 Fuel Delivery Unit GX1/ Fuel Pump Control Module J538. Testing", page 1125.
		or commercial purposes, in	Essautronised by Volkswagen A	.e.	A Newsden A	ule J538, Testing", page 1125 page 1125

	Malfunction Cri- eria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0172 System Too Rich Sank 1	The search of th	 IAT @ manifold > -48° C AAT > -48° C Oil dilution not calibrated Evap purge valve closed 		• 2 DCY of guarantee or accept	priate repair manual. - Check the Fuel Pressure Sensor G247 - Refer to 36.16 Fuel Pressure Sensor G247 Checking", page 1131 . - Check the Fuel Injectors . Refer to 36.14 Fuel Injectors . Refer to 53.6.14

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		authorised	by Volkswagen A.G. Volkswag	Jen AG does not	guarante _{80r}	ule J538, Testing", page 1125. Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139. Check the EVAP Caniston
P0190	Fuel Presi	• High fuel	oy Volkswagen AG. Volkswag	• 2.0 s	• 2 DCY	ter Purge Regulator Valve 1 - N80 Refer to **3.6.12* EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the
Fuel Pres- sure Regu- lator 1 Con- trol Cir- cuit/ Open	Sensor	pressure sensor voltage > 4.80 V		Continuous	Mayu6indoo iyaya	Fuel Pres- sure Sensor - G247 Re- fee to
		TUBINO	Protected by co	olkewagen AG.	Veringingos	Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0191 Fuel Rail Pressure Sensor Circuit Rang e/Perfor- manc	Fuel Rail Pressure (FRP) Out Of Range High	• Fuel pressure > 27,900.09 kPa	 Engine speed > 608; < 8,160 RPM Time after engine start > 5.0 s 	• 5.0 s • Continuous	• 2 DCY	- Check the Fuel Pressure Sensor- G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131.
e Bank 1			htorised by Volkswagen AG. V	olkswagen AG	does not guarantee d	- Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276 . Checking", page 1129 .
P0192 Fuel Rail Pressure Sensor Circuit Low Bank 1	Fuel Pressure LP Sensor Short To Ground	High fuel pressure sen-	Protected by copyright; O	2.0 sContinuous	• 2 DCY	- Check the Fuel Pressure Sensor-G247- Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247 Checking page 1131 Check the Fuel Pressure Regulating Valve - N276- Refer to ≈ "3.6.15 Fuel Pressure Pressure Regulating Pressure Refer to ≈ "3.6.15 Fuel Pressure Pressure Regulating Pressure Refer to % "3.6.15 Fuel Pressure Pressure Regulating Pressure Refer to % "3.6.15 Fuel Pressure Regulating Pressure Refer to % "3.6.15 Fuel Pressure Regulating Pressure Refer to % "3.6.15 Fuel Pressure Regulation Refer to % "3.6.15 Fuel Pressure Refer to % "3.6.15 Fuel Pressure Regulation Refer to % "3.6.15 Fuel Pressure Regulation Refer to % "3.6.15 Fuel Pressure Refer to % "3.6.15 Fuel Pressure Regulation Refer to % "3.6.15 Fuel Pressure Regulation Refer to % "3.6.15 Fuel Pressure Ref

Pressure althy Check Sensor sor Ration <	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Fuel (FRP) Sen- sure sor Ration- sure ality Check Sen- Circuit Rang e/Per- for- manc e				General:	• 10.0 s	• 2 DCY	
Sent Sor "A" Circuit Rang e/Performanc e **Note of the point of the p	Fuel Pres-	(FRP) Sensor Ration-	controller in- cluded adap-		l		sure Sensor - G247 Re-
Controller output > 8.0 mg e/Per- for- manc e 1	Sen- sor		-45.0% • High pressure	point 1.99 – 20.01 mg/stk			⇒ "3.6.16 Fuel Pres-
Time after engine start > 5.0 s Engine warm-up not calibrated Catalyst heating not calibrated Full load not calibrated Full load not calibrated Catalyst purge not calibrated Catalyst purge not calibrated Lambda control closed loop Lambda control closed loop Lambda control closed loop Fuel pressure set point gradient <= 200.06 kPa Depending on low dynamic conditions: Fuel pressure set point lower range > 1.99 mg/stk For time >= 5.0 s Fuel mass set point upper range < 100.32 – 172.41 mg/stk	Circuit Rang e/Per-		controller out- put > 8.0 mg	change to DFI not			G247,
lating Valve N276 - Ref to Catalyst heating not calibrated Full load not calibrated Catalyst purge not calibrated Catalyst purge not calibrated Lambda control closed loop Lambda control closed loop Lambda control closed loop Lambda control closed loop Fuel pressure set point gradient <= 200.06 kPa Depending on low dynamic conditions: Fuel mass set point lower range > 1.99 mg/stk For time >= 5.0 s Fuel mass set point upper range < 100.32 – 172.41 mg/stk	manc						Fuel Pres-
• Catalyst heating not calibrated • Full load not calibrated • Catalyst purge not calibrated • Catalyst purge not calibrated • Lambda control closed loop • Lambda control closed loop • Fuel pressure set point gradient <= 200.06 kPa • Depending on low dynamic conditions: • Fuel mass set point lower range > 1.99 mg/stk • For time >= 5.0 s • Fuel mass set point upper range < 100.32 – 172.41 mg/stk				Engine warm-up not calibrated			sure Regu- lating Valve - N276 Refer
Full load not calibrated Catalyst purge not calibrated Lambda control closed loop Lambda control closed loop Fuel pressure set point gradient <= 200.06 kPa Depending on low dynamic conditions: Fuel mass set point lower range > 1.99 mg/stk For time >= 5.0 s Fuel mass set point upper range < 100.32 – 172.41 mg/stk Full load not calibrated to Value Surge Regult tor Valve N276. Checking", page 1129 Sure Regult tor Valve N276. Checking", page 1129 The condition of the co							to ⇒ "3.6.15
Checking* page 1129 Lambda control closed loop Lambda control closed loop Evap purge functionality diagnor sis not active Fuel pressure set point gradient <= 200.06 kPa Depending on low dynamic conditions: Fuel mass set point lower range > 1.99 mg/stk For time >= 5.0 s Fuel mass set point upper range < 100.32 – 172.41 mg/stk For time >= 5.0 s							sure Regula- tor Valve
point lower range > 1.99 mg/stk • For time >= 5.0 s • Fuel mass set point upper range < 100.32 – 172.41 mg/stk							Checking",
point lower range > 1.99 mg/stk • For time >= 5.0 s • Fuel mass set point upper range < 100.32 – 172.41 mg/stk				 Lambda control closed loop 			
point lower range > 1.99 mg/stk • For time >= 5.0 s • Fuel mass set point upper range < 100.32 – 172.41 mg/stk			orised by Volkswagen AC	•V∘Evap purge func- tionality diagno _{o/} sis not active	u _{arante}		
point lower range > 1.99 mg/stk • For time >= 5.0 s • Fuel mass set point upper range < 100.32 – 172.41 mg/stk		eduniessau	, o	 Fuel pressure set point gradient <= 200.06 kPa 	"CE OF ACCEPTE	ò.	
point lower range > 1.99 mg/stk • For time >= 5.0 s • Fuel mass set point upper range < 100.32 – 172.41 mg/stk		Snotbermin		 Depending on low dynamic con- ditions: 		Y liebility with	
• For time >= 5.0 s • Fuel mass set point upper range < 100.32 – 172.41 mg/stk • Fuel mass set point gradient -1,389.00 – 2.20 mg/stk • For time >= 1.2 s • Depending on canister purge: • Canister load <= 0.70 [-] • Evap purge valve not active or	rinwhai			 Fuel mass set point lower range > 1.99 mg/stk 		respect to	
• Fuel mass set point upper range < 100.32 – 172.41 mg/stk • Fuel mass set point gradient -1,389.00 – 2.20 mg/stk • For time >= 1.2 s • Depending on canister purge: • Canister load <= 0.70 L1 • Evap purge valve not active or	oart o			• For time >= 5.0 s		the co	
• Fuel mass set point gradient -1,389.00 – 2.20 mg/stk • For time >= 1.2 s • Depending on canister purge: • Canister load <= 0.70 [-] • Evap purge valve not active or	purposes, in p			 Fuel mass set point upper range < 100.32 – 172.41 mg/stk 		orrectness of	
• For time >= 1.2 s • Depending on canister purge: • Canister load <= 0.70 [-] • Evap purge valve not active or	le io	or commerci		 Fuel mass set point gradient -1,389.00 – 2.20 mg/stk 		information in ,	
• Depending on canister purge: • Canister load <= 0.70 [-] • Evap purge valve not active or		O'BRAIL.		• For time >= 1.2 s		in i	
Canister purge: • Canister load <= 0.70 [-] • Evap purge valve not active or		10101.		Depending on	allaluf.	Ś	
• Evap purge valve		*1100°	1461Y900 E	Canister purge:Canister load <= 0.70 [-1]	rampiyqoo, t		
closed			Protected	not active or			

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Fuel Rail Pressure (FRP) Sen- sor Ration- ality Check High	Deviation lambda of controller included adaptation > 30.0% And	ConditionsGeneral:Engine speed 608 – 1,088 RPM	Length		dure
		not active or closed			

DTC / De- scription titon P0201			ise			4/dh	
Cylinder 1 Injector Union Circuit	De- scrip-	Strategy	teria and Thresh-	ters with Enable	Time	MIL fillumina- tion	Component Diagnostic Procedure
-2 ⁷ d -1 ² A	Cylin- der 1 Injec- tor "A"	tor Open Circuit Fuel Injector Short Circuit Fuel Circuit	for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V Fault pattern for short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms	 active ~ Signal (tco) >= -30° C Engine speed < 7.000 RPM 	CRK • Continuous		tors . Refer to "3.6.14 Fuel Injectors , Checking".

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running			
		• Injector low side voltage < 2.0 V				
		Injector low side switch current > 25.0 A				
		• Injector low side voltage < 2.0 V				
		• Injector high side switch current > 25.0 [-]	*holieedpy Volkev	agen AG. Volks	wagen AG does no	t gu _{arantee}
		• Injector low side voltage < 2.0 V	ited in less auth			or acceptant
		Injector low side switch current (hard-ware values) > 9.0 – 14.0 A	artifice durke se authorised by Volks v			
		• Injector volt- age < 2.0 V		Y		
		• Injector low side switch current > 25.0 [-]				
		age \ 2.0 V				
		• Injector low side switch current (hardware values) > 9.0 – 14.0 A	Real Tology			ilgaluoga
		• Injector load resistance to ground and battery > 20.0	Seand to Edingo Moingoo Kapai	_D ejor ^A	DA nagen AG.	o Manufindo O juanno de ja
		Injector low side switch current > 25.0 A				
		• Injector load resistance to ground and battery > 20.0 Ω				

Injector low side voltage < 2.0 V Fuel Injector Short Circuit Fuel Injector Circuit Fuel Injector low side voltage < 2.0 V Fuel Injector curtor short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms Fuel Injector low side voltage < 7,000 RPM Injection time >= 0.0 s Injection time >= 0.0 s	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cylinder 2 Injector University of Circuit			side switch current > 25.0 [-] • Power stage temperature >	-30° Č • Engine speed < 7,000 RPM • Injection time >=			
Fuel Injector Circuit Fault pattern for short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase < 0.064 ms Injector current rise time during peak phase current rise time during peak phase current rise time during peak phase current rise t	Cylinder 2 Injector "A" Circuit	Fuel Injector Short Circuit	Fault pattern for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V Fault pattern for short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	CRK • Continuous		Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running			
		• Injector low side voltage < 2.0 V				
		Injector low side switch current > 25.0 A				
		• Injector low side voltage < 2.0 V				
		Injector high side switch current > 25.0 [-]				
		• Injector low side voltage < 2.0 V	sedby Volkswagen A	.G. Volkswage _r	AG does not guare	
		Injector low side switch current (hardware values) > 9.0 - 14.0 A	essauthorised by Volkswagen A			Nec Or accept ADL
		• Injector volt- age < 2.0 V				ty with res
		Injector low side switch current > 25.0 [-]				pect to the co
		age ≰ 2.0 v				rrectnes
		Injector low side switch current (hardware values) > 9.0 – 14.0 A				s of information
		• Injector load resistance to ground and battery > 20.0	Ruffolo			in i
		Injector low side switch current > 25.0 A	Protected by Copyright, Copyright	10	A nagewe ^{AloV} kd ⁱ n	The correctness of Information in this document.
		• Injector load resistance to ground and battery > 20.0 Ω				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern fault pattern via power stage diagnosis detected	•Vol Engine running	larantee or acc		
	Electrical Error	 Injector low side voltage < 2.0 V Injector low side switch current > 25 0 	Secondary Parameters with Enable Conditions •VolEngine running •VolEngine running	Sp _r G	A lightity with res	
es, in part or in w _b ,		Injector low side voltage < 2.0 V			pect to the correct	
, raial purpos	اللاها	side switch current > 25.0 [-] Injector low			ness of informa	
	mooroaleurid to to	side voltage < 2.0 V Injector low side switch		Sur	ion in this co	
	Wood	 [-] Injector low side voltage < 2.0 V Injector low side switch current (hardware values) > 9.0 - 14.0 A Injector voltage < 2.0 V Injector low 	JA Nagenagen A.G.	QMDINIOD TE		
		Injector low side switch current > 25.0 [-]				
		• Injector volt- age < 2.0 V				
		Injector low side switch current (hard- ware values) > 9.0 – 14.0 A				
		Injector load resistance to ground and battery > 20.0 Ω				
		Injector low side switch current > 25.0 A				
		• Injector load resistance to ground and battery > 20.0 Ω				

De- S	fonitor trategy scription	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	8 not _{polynie}	Injector high side switch current > 25.0 [-]	 ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	guarant	Red acceptant librillia mills	
Injector "A" Circuit	el Injec- Open Cuit Shor	 Fault pattern for open circuit via power stage diagnosis detected Injector low side voltage < 2.0 V Fault pattern for short circuit via power stage diagnosis detected Injector current rise time during peak phase < 0.064 ms 	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	8,640.0° CRK Continuous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking". page 1127 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injection Valves Electrical Error	Indeterminate fault pattern via power stage diagno- sis detected	Engine running			
		• Injector low side voltage < 2.0 V	wagen AG. Volkswagen AG.	does not a		
		Injector low side switch current > 25.0 A Injector low		avarani	ROTACCEDT.	
	Snotpomilie	Injector low side voltage < 2.0 V			RAN LIBITITY WITH	
	or in whole, _{is}	• Injector high side switch current > 25.0 [-]			U (Gab.	pect to th
	oses, in part	• Injector low side voltage < 2.0 V	\rightarrow			ne correctne
	orcommercial purposes, in part or in whole, is not benny.	Injector low side switch current (hard- ware values) > 9.0 – 14.0 A			op of the state of	SS Of Info
					in this odo.	
		Injector low side switch current > 25.0		OVVOTRE!	Kgo, Jugur,	
		• Injector volt ^y / _s age < 2.0 V	Protect	· TOIKEMSÃ		
		Injector low side switch current (hard- ware values) > 9.0 – 14.0 A				
		• Injector load resistance to ground and battery > 20.0 Ω				
		Injector low side switch current > 25.0 A				
		Injector load resistance to ground and battery > 20.0 Ω				

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Paramesters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Injector high side switch current > 25.0 [-] Power stage temperature > 150° C 	 ~~ Signal (tco) >= -30°C Engine speed < 7,000 RPM Injection time >= 0.0 s 			
P0221 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "B" Circuit Rang e/Per- for- manc e	sition Sen- sor (TPS) 2	 Normalised difference between measured and modeled value of mass air flow from TPS 2 >= 1.0 [-] Relative mass air flow integral from TPS 2 > 60.0 [-] 	Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) not active	• Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking". page 1169
P0222 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "B" Circuit Low	Throttle Position Sensor (TPS) 2 Short To Ground / Open Circuit	Throttle position sensor 2 voltage < 0.17 V	·	• Continuous	• 2 DCY	Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169
	Throttle Position Sensor (TPS) 2 Short To Battery Plus	Throttle position sensor 2 voltage > 4.83 V		0.2 s Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MI Time Length	IL Illumina- tion	Component Diagnostic Procedure
P0234 Turbo- charg- er/Su- per- charger over the control of the co	Control Out Of Range High	Boost pressure calculated max. plausible value Boost pressure deviation < 209.90 – 265.0 kPa Turbocharger protection active	 Engine running Accelerator pedal value > 0.0% Fuel cut off not calibrated Difference between boost pressure and barometric pressure >= 20.0 kPa 	• 1.3 s of the state of the sta	2 DCY 2 DCY 2 DCY 3 Information in the correctness of information in the c	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
P0236 Turbocharger/Super-charger Boost Sensor "A" Circuit Rang e/Performanc e	charger (TC) Boost Pressure	 Diff. turbo-charger boost pressure vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa Diff. BARO vs. MAP <= 7.50 kPa 	 Case 1: engine stop during DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle not calibrated For time >= 10.0 s Case 2: engine stop @ start of DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle not calibrated 	• 3.0 s	2 DCY	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Turbo- charger (TC) Boost Pressure Sensor ECM Keep Alive-Time: Cross Check	• Turbocharger boost pressure sensor voltage < 0.20 V	 Engine stopped Vehicle speed < 1 km/h ECM keep alivetime 10.0 – 6,553.5 s Time after engine stop >= 5.0 s BARO sensor voltage 0.20 – 4.80 V MAP sensor voltage 0.20 – 4.80 V Boost pressure sensor voltage 0.20 – 4.80 V 	• 0.5 s	• 2 DCY 2 DCy a liability with respect to the correctness of information in this correctness of information in the correctness of the correctness of information in the c	- Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31, Checking", page 1115 Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0238 Tur- bo- charg- er/Su- per- charg- er Boost Sen- sor "A" Circuit High	Turbo-charger (TC) Boost Pressure Sensor Circuit High	Turbocharger boost pressure sensor voltage > 4.80 V		• 0.5 s ^q uar. • Continuous	• 2 DCY	Sensor G31, Checking", page 1115. Check the Actuator - V465 Refer to \$\infty\$ "3.6.7 Charge Air Pressure Ac-
P025 A Fuel Pump Mod- ule "A" Con- trol Cir- cuit/ Open	Fuel Pump (FP) Open Circuit	Signal voltage lower range > 1,92 – 2.21 V Signal voltage upper range < 2.85 – 3.25 V	• Actnator commanded off	O.5 s Continuous Uage Maylon Kon	• 2 DCY of the state of the sta	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
P025 C Fuel Pump Mod- ule "A" Con- trol Circuit Low	Fuel Pump (FP) Short To Ground	• Signal voltage < 1.92 – 2.21 V	Actuator com- manded off	0.5 sContinuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P025 D Fuel Pump Mod- ule "A" Con- trol Circuit High	Fuel Pump (FP) Short To Battery Plus	Power stage temperature > 160.0 - 200.0° C Signal current > 100.0 - 180.0 mA Niseedby Volkswagen AG.	Actuator commanded on Volkswagen AG does not gut	• 0.5 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
Cylin-	Fuel Injec- tor Circuit Low	 Fault pattern for circuit low via power stage diagnosis detected Injector voltage < 2.0 V 	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	 8,640.0° CRK Continuous 720° CRK 	2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 3 DCY 2 DCY 3 DCY 5 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
9	Fuel Injec-	Injector driver high side switch current < 25.0 A Injector driver low side switch current < 25.0 A Injector driver	-30° Č • Engine speed < 7,000 RPM • Injection time >= 0.0 ms	• Continuous	mation in this co	
	tor Circuit Low (High Side)	voltage < 2.0 V • Injector driver high side switch current > 25.0 A				
P0262 Cylinder 1 Injector "A" Circuit High	Fuel Injec- tor Circuit High	 Fault pattern for circuit high via power stage diagno- ses detected Injector volt- age > 2.0 V 	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	 8,640.0° CRK Continuous 	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
n whole, is not be	Fuel Injector Circuit High (Low Side) Fuel Injector Circuit High (High Side)	 Injector driver voltage > 2.0 V Injector driver low side switch current > 25.0 A Injector driver voltage > 2.0 V Injector driver high side switch current > 25.0 A 	Engine running ~~ Signal (tco) >= -30° C kswagen A Engine speed < 7,000 RPM Injection time >= 0.0 ms	• 720° CRK • Continuous	withrespect	
P0264 Cylinder 2 Injector "A" Circuit	Fuel Injector Circuit Low Fuel Injector Circuit	 Fault pattern for circuit low via power stage diagnosis detected Injector voltage < 2.0 V Injector driver voltage < 2.0 V Injector driver high side switch current < 25.0 A Injector driver low side switch current < 25.0 A Injector driver low side switch current < 25.0 A Injector driver voltage < 2.0 V 	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s Engine running ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 ms 	• 720° CRK	OD DE CORRECTIONS OF INFORMATION L.	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking". page 1127.
	Fuel Injector Circuit High	 Injector driver high side switch current > 25.0 A Fault pattern for circuit high via power stage diagnoses detected Injector voltage > 2.0 V 	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	8,640.0° CRK Continuous	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injector Circuit High (Low Side)	 Injector driver voltage > 2.0 V Injector driver low side switch current > 25.0 A Injector driver 	 Engine running ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 ms 	• 720° CRK • Continuous		
	Fuel Injec- tor Circuit High (High Side)	 Injector driver voltage > 2.0 V Injector driver high side switch current > 25.0 A 	oy Volkswagen AG. Volkswa	gen AG _{does no}	guarantee or acce	
P0267 Cylinder 3 Injector "A" Circuit Low	Fuel Injector Circuit Low	• Fault pattern for circuit low via power stage diagnosis detected • Injector voltage < 2.0 V	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	• 8,640.0° CRK	• 2 DCY 🦠	- Check the Fuel Injectors . Refer to 3.6.14 Fuel Injectors , Checking", page 1127
	Fuel Injec-	voltage < 2.0 V Injector driver high side switch current < 25.0 A Injector driver low side switch current < 25.0 A	 ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 ms 	• 720° CRK • Continuous	ukdo ikauri	the correctness of information in this of
	Fuel Injector Circuit Low (High Side)	Injector driver voltage < 2.0 V Injector driver high side switch current > 25.0 A	Protected by co	J.Kewagen A.G.	Mayufiyido jaayic	
	Fuel Injector Circuit High	 Fault pattern for circuit high via power stage diagno- ses detected Injector volt- age > 2.0 V 	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	8,640.0° CRK Continuous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injector Circuit High (Low Side) Fuel Injector Circuit High (High Side)	 Injector driver voltage > 2.0 V Injector driver low side switch current > 25.0 A Injector driver voltage > 2.0 V Injector driver high side 	 Engine running ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 ms 	• 720° CRK • Continuous		
	Fuel Injector Circuit Low	switch current > 25.0 A • Fault pattern for circuit low via power stage diagno- sis detected • Injector volt- age < 2.0 V	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	uous		- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
	Fuel Injector Circuit Low (Low Side) Fuel Injector Circuit Low (High Side)	Injector driver high side switch current < 25.0 A Injector driver low side switch current < 25.0 A Injector driver	Volkswage	en A720° CRKs no.	guarantee or acceptar.	Highling with respect to the correctness of informeck the
	Fuel Injector Circuit High	Fault pattern for circuit high via power stage diagnoses detected Injector voltage > 2.0 V	 Engine stop not active ~~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 s 	• 8,640.0° CRK • Continuous	· 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Fuel Injector Circuit High (Low Side) Fuel Injector Circuit High (High Side)	 Injector driver voltage > 2.0 V Injector driver low side switch current > 25.0 A Injector driver voltage > 2.0 V Injector driver high side switch current > 25.0 A 	 Engine running ~ Signal (tco) >= -30° C Engine speed < 7,000 RPM Injection time >= 0.0 ms 	• 720° CRK • Continuous	en A G does not gu	Fantee Or accept and lie
Tur- bo-	Turbo- charger (TC) Boost Pressure Control Out Of Range Low	Boost pressure calculated min. plausible value Boost pressure deviation > 5.0 kPa	 Engine running Turbo charger bypass valve closed For time >= 1.0 s Pressure ratio before charger set point > 1.30 [-] For time >= 1.2 - 1.9 s Engine speed > 2,208 - 2,750 RPM Barometric pressure > 73.0 kPa ECT > -10° C No cylinder is shut off Fuel tank level >= 0.0 % 	• 4.0 s • Continuous	• 2 DCY	- Check the Charge Air Pressure Sensor - G31 - Refer to ⇒ "3.6.8 Charge Air Pressure Sensor G31 Checking", page 1115 - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 Checking", page 1113

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake	• For 1.8L: Tur-	Engine running	• 0.01 s		
	Manifold Adaptive	bo charger ac- tuator set	Conditions:	• Contin-		
	Value Check	point >= 17.0 - 20.0%	• For time >= 0.5 s	uous		
		• For 2.0L: Turk bo charger actuator set point >= 18.0	 Engine running Conditions: For time >= 0.5 s Difference benage tween filtered boost pressure and basic boost pressure > 40.01 kPa Difference between filtered boost pressure set point and basic boost pressure set point and basic boost pressure > 40.01 kPa 	does not guaran	e or accepta	
	whole, is not being.	bo charger actuator set point >= 18.0 21.0%	 Difference be- tween filtered boost pressure set point and ba- sic boost pres- sure > 40.01 kPa 		W lightin with took	D D D D D D D D D D D D D D D D D D D
	in part or in		Boost pressure control deviation < 20.0 kPa			t to the corre
	sesodund		 Boost pressure set point < 16.0 kPa 			ctness of
	sommercial		 Actual boost pressure < 30.0 kPa 		ation	infor
	Joan St.	FOR TOTAL PROPERTY OF THE PARTY	 Boost pressure control deviation < 20.0 kPa Boost pressure set point < 16.0 kPa Actual boost pressure < 30.0 kPa Difference between current boost pressure set point and basic boost pressure > 3.0 kPa ECT > -20° C IAT @ throttle > 0° C Engine speed 2,500 - 6,800 RPM Conditions: 	6	Ando italino de la companya de la co	
		J.Mdos Agpe	• ECT > -20° C • IAT @ throttle ≯ ^{uc} 0° C	gewey/olkswag		
			• Engine speed 2,500 – 6,800 RPM			
			Conditions:			
			 For time >= 5,000.0 ms 			
			Difference be- tween actual tur- bocharger speed and maximum turbocharger speed set point > 9,003 RPM			
			Conditions:			
			• For time >= 1,000.0 ms			
			No gear shift			
			Fuel cut off not active			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Ran- dom/	Misfire Crankshaft Speed Fluc- tuation (Multiple)	Number of cylinders with emission threshold mis- fire within 4,000 revolu-	Emission thresh- old misfire detec- ted	• 1,000 rev • Continuous	• 2 DCY	Check the spark plugs visually for signs of fouling.
der Mis- fire De- tected		 tions >= 2.0 [-] Number of cylinders with emission threshold mis- 				Check the intake system visually for leaks (false air).
	purposes, in part or in whole .	fire within	Volkswagen AG. Volkswage			reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. - Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/ or to appropriate repair manual. - Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 .
						Check the Ig- nition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Number of cylinders with catalyst damaging misfire >= 2.0 [-]	Catalyst damaging misfire detected	 200 rev Continuous 	ately	with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage , Checking", page 1133 .
	orcial purposes, in part or in who.	The state of the s	Nolkswagen AG. Volkswag	en AG does not	Avarantee or acceptable and acceptab	nability with respect to the correctness of information in this

DTC / De- scrip- tion	Monitor Strategy Description		lalfunction Cri- ria and Thresh- old Value	S	econdary Parame- ters with Enable Conditions		onitoring Time Length	MIL	_ Illumina- tion	ag	omponent Di- gnostic Proce- dure
Cylin- der 1 Mis- fire	Misfire Crankshaft Speed Fluc- tuation (Sin- gle Or Multi-	•	Catalyst damage misfire: For 1.8L: Catalyst damaging misfire		Initial engine speed > 550 RPM Engine speed > 550 RPM	•	200 rev Contin- uous		Immedi- ately	1	Check the spark plugs visually for signs of foul- ing.
De- tected	ple)		rate > 4.72 – 20.83% For 2.0L: Cat-	•	Engine speed < 6,848 RPM Time after engine					_	Check the intake system visually for
			alyst damag- ing misfire rate > 5.0 –	•	start not calibra- ted s For 1.8L: Engine						leaks (false air). Check for an
		•	31.25% Emission threshold mis-	•	load > 6.30 – 43.0% For 2.0L: Engine	AG	i. 1 ,0 0 0age	n Ac	2 DCY		engine me- chanical fault with a cylin-
			fire within 1,000 rev:	• 6	load > 7:08 – 47:0% Depending on	•	Contin- uous		2 DCY Fullogs not gual	ante	der compression test. Carbon buildup may
			threshold mis- fire rate (MR)	Miles	ECT downstream engine @ start ECT downstream						cause a high- er than nor- mal com
			ole, is not o		engine @ engine start <= -48° C						reading and may contrib- ute to this
			art or in w	•	Then activation if ECT downstream engine >= 20° C						concern. Re- fer to appro- priate repair manual for
			> 2.25% whoses, in part or in whole, is not looking the commercial purposes.	•	ECT downstream engine @ engine start > -48° C						low com- pression readings or
			imercial pu'	•	Fuel cut off not active Single fuel cut off						for carbon buildup removal.
			mooto aleving the		not active Number of fade out cylinders <					_	Check the fuel pressure and delivery quantity. Re-
			46	04,	2.0 [-] Dynamic manifold air pressure		1/4	7		Gul	.0"
					not calibrated kPa		9	ĐA n	e geweylo Vya	Moi	ter to fuel system me- chanical test- ing in ⇒ "3.1 Pre- liminary Check",
				•	Dynamic throttle position not calibrated ° TPS/s						page 13 and/ or to appro- priate repair manual.
				•	Dynamic of engine load not calibrated %					_	Check the Fuel Injec-
				•	Engine not cali- brated Engine speed not						tors . Refer to ⇒ "3.6.14 <u>Fuel Injectors</u> , Check-
					calibrated RPM						<u>ing",</u> page 1127 .
										-	Check the Ig- nition Coils

					-02	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		• Emission threshold missire within 4,000 rev: • Emission threshold missire rate (MR) > 2.40%	Dynamic of ignition angle @ idle speed not calibrated ° CRK Dynamic of ignition angle not calibrated ° CRK Rough road not detected Dynamic of ignition angle not calibrated ° CRK Rough road not detected	• 4 x 1,000 rev • Continuous	SMO Ved Ingilito O. In	with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage 3 Checking", page \$1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring M Time Length	IIL Illumina- tion	Component Diagnostic Procedure
Cylin- der 2 Mis-	Misfire Crankshaft Speed Fluc- tuation (Sin- gle Or Multi-	 Catalyst damage misfire: For 1.8L: Catalyst damage 	 Initial engine speed > 550 RPM Engine speed > 550 RPM 	• 200 rev • Continuous	Immedi- ately	Check the spark plugs visually for signs of foul-
fire De- tected	ple)	ing misfire rate > 4.72 – 20.83%	• Engine speed < 6,848 RPM			ing. - Check the intake system
	a diness authorised by the second	• For 2.0L: Catalyst damaging misfire volks rate \$5.0 - 31.25%	Time after engine start not calibrated s wagen AG For 1.812 Engine load > 6.30 43.0%			visually for leaks (false air). - Check for an engine me-
	sdunless author	Emission threshold mis- fire within 1,000 rev:	• For 2.0L: Engine load > 7.08 – 47.0%	• Continuous	2 DCY	chanical fault with a cylin- der compres- sion test. Carbon
ole, is not be		• Emission threshold mis- fire rate (MR) > 2.25%	Depending on ECT downstream engine @ start	lity with rest		buildup may cause a high- er than nor- mal com-
art or in wh			ECT downstream engine @ engine start <= -48° C	th respect to the converses of information in this quality	to the C	pression reading and may contrib- ute to this
es, in p			Then activation ifECT downstream		correct	concern. Re- fer to appro-
purpos			engine >= 20° C	igos Of	Tess of	priate repair manual for
mmercial			• ECT downstream engine @ engine start > -48° C	informatic		low com- pression readings or for carbon
ate of co			Fuel cut off not active	ninthis		buildup re- moval.
	104010III		Single fuel cut off not active	alfaltroop		 Check the fuel pressure
	ACTOTOPINGO WEWA	Do Agno	• Number of fade out cylinders < Noun 2.0 [-]	50° *		and delivery quantity. Re- fer to fuel
		, _{red} oejo14	Dynamic manifold air pressure not calibrated kPa			system me- chanical test- ing in ⇒ "3.1 Pre- liminary
			Dynamic throttle position not cali- brated ° TPS/s			Check", page 13 and/ or to appro- priate repair
			Dynamic of en- gine load not cali- brated %			manual. - Check the
			Engine not cali- brated			Fuel Injec- tors . Refer to ⇒ <u>"3.6.14</u>
			Engine speed not calibrated RPM			Fuel Injectors, Checking", page 1127
						 Check the Ig- nition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	agnostic Proce-
		Emission threshold misfire within 4,000 rev: Emission threshold misfire rate (MR) > 2.40%	• Dynamic of ignition angle @ idle speed not calic. Volume of ignition angle not calibrated ° CRK • Rough road not detected		Pes not guarantee or a service of a service	with respect to the correctness of information in this coordinates

			edby	9u _{ara}	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring MIL Illumina- Time Length	Component Diagnostic Procedure
Cylin- der 3 Mis- fire De-	Misfire Crankshaft Speed Fluc- tuation (Sin- gle Or Multi- ple)	Catalyst damage misfire: For 1.8L: Catalyst damaging misfire rate > 4.72 –	 Initial engine speed > 550 RPM Engine speed > 550 RPM Engine speed < 	200 rev Continuous Immediately	- Check the spark plugs visually for signs of foul- ing.
tected		20.83% For 2.0L: Catalyst damaging misfire rate > 5.0 − 31.25% Emission threshold misfire within 1,000 rev:	 6,848 RPM Time after engine start not calibrated s For 1.8L: Engine load > 6.30 - 43.0% For 2.0L: Engine load > 7.08 - 47.0% 	• 1,000 • 2 DCY rev • Continuous	 Check the intake system visually for leaks (false air). Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may
		Emission threshold mis- fire rate (MR) > 2.25%	 Depending on ECT downstream engine @ start ECT downstream engine @ engine start <= 48° C 	. DA nagawahlo Vydrheingoo in	buildup may cause a higher than normal compression reading and may contribute to this
			 Then activation if ECT downstream engine >= 20° C 		fer to appro- priate repair
			 ECT downstream engine @ engine start > -48° C Fuel cut off not 		manual for low com- pression readings or for carbon buildup re-
			activeSingle fuel cut off not active		moval. - Check the
			Number of fade out cylinders < 2.0 [-]		fuel pressure and delivery quantity. Re- fer to fuel system me-
			 Dynamic mani- fold air pressure not calibrated kPa 		chanical test- ing in ⇒ "3.1 Pre- liminary
			Dynamic throttle position not cali- brated ° TPS/s		Check", page 13 and/ or to appro- priate repair manual.
			 Dynamic of en- gine load not cali- brated % 		Check the Fuel Injec-
			 Engine not calibrated Engine speed not calibrated RPM 		tors . Refer to ⇒ "3.6.14 Fuel Injec- tors , Check-
			Cambrated INFIM		ing", page 1127 Check the Ig-
					nition Coils

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Emission threshold misfire within 4,000 rev: Emission threshold misfire rate (MR) > 2.40% 	 Dynamic of ignition angle @ idle speed not calibrated ° CRK Dynamic of ignition angle not calibrated ° CRK Rough road not detected 	4 x 1,000 rev Continuous		with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage , Checking", page 1133 .
	, n part or in we.	Sold of the state	oy Volkswagen AG. Volkswag	gen AG does no	guarantee or acceptara	Highlity with respect to the corre
	Sesod nor loses	THOMAS CANADA THOMAS TH	Profed by Co	Olkawagen AG.	A Diag	nosis and Testing 84

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0304 Cylin- der 4	Misfire Crankshaft Speed Fluc-	Catalyst dam- age misfire:	Initial engine speed > 550 RPM	200 revContin-	Immedi- ately	 Check the spark plugs visually for
Mis- fire	tuation (Sin- gle Or Multi-	For 1.8L: Cat- alyst damag- ing misfire	• Engine speed > 550 RPM	uous		signs of foul- ing.
De- tected	ple)	rate > 4.72 – 20.83%	• Engine speed < 6,848 RPM			Check the intake system
		For 2.0L: Cat- alyst damag- ing misfire	Time after engine start not calibra- ted s			visually for leaks (false air).
		rate > 5.0 – 31.25%	• For 1.8L: Engine load > 6.30 – 43.0%	SW200 is		Check for an engine me-chanical fault
		Emission threshold misfire within 1,000 rev: Emission	• For 1.8L: Engine load > 6.30 – 43.0% • For 2.0L: Engine load > 7.08 – 47.0% • Depending on ECT downstream engine @ start	rev Continuous	• 2 DCY Snot guaranteeorae	with a cylin- der compres- sion test. Carbon
		threshold mis- fire rate (MR)	Crigino (a) Start			buildup may cause a high- er than nor- mal com-
		25,000 18 19 19 19 19 19 19 19 19 19 19 19 19 19	• ECT downstream engine @ engine start <= -48° C			pression reading and may contrib-
		nwh	Then activation if			ute to this concern. Re-
		npart or	ECT downstream engine >= 20° C			fer to appro- priate repair manual for
		255%	• ECT downstream engine @ engine start > -48° C			low com- pression readings or for carbon
		nercial p	Fuel cut off not active			buildup re- moval.
		e or comir	Single fuel cut off not active			Check the fuel pressure
		ENITA OF BUSE	Number of fade out cylinders < 2.0 [-]		3.7	and delivery quantity. Re- fer to fuel system me-
		, co	Dynamic manifold air pressure not calibrated kPa	. DAnagay	CODNIAND NOKE	chanical test- ing in ⇒ "3.1 Pre- liminary
			Dynamic throttle position not cali- brated ° TPS/s			or to appro- priate repair
			Dynamic of en- gine load not cali- brated %			manual. - Check the
			Engine not cali- brated			Fuel Injec- tors . Refer to ⇒ "3.6.14
			Engine speed not calibrated RPM			Fuel Injectors, Checking". page 1127.
						Check the Ignition Coils

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
orcommercial purposes, in part or in whole, is not be not be milk.	A to the sea of the se	orieed by Volkeway	 Emission threshold misfire within 4,000 rev: Emission threshold misfire rate (MR) > 2.40% 	Dynamic of ignition angle @ idle speed not calibrated ° CRK Dynamic of ignition angle not calibrated ° CRK Rough road not detected does not guarantes of acceptantes of acc	4 x 1,000 rev Continuous		with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking". page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0326 Knock /Com- bus- tion Vibra- tion Sen- sor 1 Circuit Rang e/Per- for- manc e Bank 1 or Single Sen- sor	Knock Sensor (KS) Rationality Check Low	For time >= 3.0 s Difference between knock sensor signal and average knock sensor signal < 0.0 – 0.12 V	 ~~ Signal (tco) > 60° C Air mass > 229.0 mg/stk 	4.3 sContinuous	• 2 DCY	- Check the Knock Sensor 1 - G61 - Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141.
P0327 Knock /Com- bus- tion Vibra- tion Sen- sor 1 Circuit Low Bank 1 or Single Sen- sor	Knock Sensor (KS) Out Of Range	• Sensor signal < 0.12 – 0.31 V	 ~~ Signal (tco) > 60° C Air mass > 229.0 mg/stk Engine speed > 2.016 RPMen AG d 	4.0 s Continuous Oes not guarante.	• 2 DCY	- Check the Knock Sensor 1 - G61 - Refer to ⇒ "3.6.21 Knock Sensor 1 G61 , Checking", page 1141 .
shaft Posi-	Crankshaft Position (CKP) Sen- sor Ration-	 Pulse width backwards < 62; > 150 μs For number of pulse widths outside tolerance > 1.0 [-] Pulse width forwards < 15; > 62 μs For number of pulse widths outside tolerance > 1.0 [-] 	• Engine speed > 0.0; <= 3,000 RPM	• 1,800.0° CRK • Continuous	• 2 DCY	Refer to ⇒ "3.6.11 Engine Speed Sensor GZes",

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Crankshaft Position (CKP) Sen- sor Activity Check	Case 1: Counted exhaust camshaft signals without synchronization not active [-]	 Signal edges @ selected camshaft signal detected Choice of: Ignition off 	0.01 s Continuous		
	Solitor State of the state of t	 Counted intake camshaft signals without synchronization not active [-] Case 2: Counted exhaust camshaft signals without synchronization not active [-] Counted intake camshaft signals without synchronization >= 17.0 [-] 	 Engine speed > 380 RPM Engine stalling >= 1.0 s Synchronization test incorrect Engine speed >= 380 RPM Engine running Engine stalling >= 5.0 s Backwards rotation not detected Engine speed >= 400 RPM Engine stop active 	gu _{alrantee} o _{racces}	* and habitid with	
Crank shaft Posi- tion Sen- sor "A"	Engine Speed Sen- sor Out Of Range	• Counted teeth vs. reference >= 1,000,000; <= 1,000 μs		• 3,600.0° CRK • Continuous	$_{ m spect}$ to the correctness of information in this ca	- Check the Engine Speed Sensor - G28- Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121. - Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
	Position (CKP) Sen-	• Segment adaptation >= 0.70 %	 Fuel cut off active Delay time >= 5,760.0° CRK 	• 180.0° CRK			
	sor Out Of Range		Diff. actual air mass vs. previ- ous air mass <= 20.01 – 39.99 mg/ stk				
			• Engine load <= 20.0%				
			 Dynamic throttle position <= 269.50 - 398.40° TPS/s 				
			Rough road not detected Engine rough	lby Volkswagen	AG. Volkswagen A	Gdoesnot gua	
			Engine roughsoise ness signal not valid			arantee or	CCCOpy
			• Segments in fuel cut-off mode >= 32.0 [-]				AUA lightility A
			Segment adapta- tion finished				
			• Engine speed 2,016 – 5,024 RPM				
			• 👸 6 cylinder engine:				
			Diff. between adapted value of cylinder 1 and cylinder 6 not calibrated %				CCBDIAN IIAHIIN MIE
			Diff between adapted value of cylinder 4 and cylinder 2 not calibrated %				ing in the state of the state o
			Diff. between adapted value of cylinder 3 and cylinder 5 not calibrated %	doo Vd beloelolo	.5A	nagewaylo V tarribirgo	
			4 cylinder engine:				
			 Diff. between adapted value of cylinder 1 and cylinder 3 < 0.70% 				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Diff. between adapted value of cylinder 2 and cylinder 4 < 0.70%	Continuous		
	Crankshaft Position (CKP) Sen- sor Ration- ality Check Low	 Case 1: Engine speed > 3,000 RPM Time between falling signal edges 0 – 50 µs Case 2: Engine speed <= 3,000 RPM Time between signal edges < 30 µs 		• CRK • Continuous		
	Crankshaft Position (CKP) Sen- sor Ration- ality Check	• Counted teeth vs. reference >= 1.0 - <= 2.0 [-]	 General conditions: Engine speed > 320 RPM Case 1: Ignition off Engine speed > 380 RPM Engine stalling >= 1.0 s Case 2: Engine speed >= 380 RPM Engine running Engine stalling >= 5.0 s Case 3: Backwards rotation not detected Case 4: Engine speed >= 400 RPM Engine stopped Engine stopped 	CRK Continuous	agen AG does not s	Watantee or accept and light with the state of the state

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Crankshaft reference gap	General conditions:	• 2,160.0° CRK		
		not detected	Reference gap of relucter wheel detected	Continuous		
			• Case 1:			
			Ignition off			
			• Engine speed > 380 RPM			
			• Engine stalling >= 1.0 s			
			• Case 2:			
			• Engine speed >= 380 RPM			
			Engine running			
			• Engine stalling >= 5.0 s			
			• Case 3:			
			Backwards rotation not detected			
			 Case 4: Engine speed >= 400 RPM 	G. Volkswagen	AG does not	
			• Engine speed >= 400 RPM		or guaran	*0-
		, l'	Engine stopped		AG does not guaran	QOP GOOD
Cam- shaft	Camshaft Position (CMP) In- take Sensor Signal Ac- tivity Check	No change of commercial purposes, in part or in whole, is not on the purposes. Solution in the purpose of the	• Engine speed >= 400 RPM	CRK	• 2 DCY	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 Checking", page 1107 - Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.4 Engine Speed Sensor - G28 Speed Sensor G28 Checking", page 1121

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cam-shaft Posi-stion Sen-sor "A" Circuit Rang e/Per-for-manc Bank 1 or Single Sen-	Camshaft Position (CMP) In- take Sensor Rationality Check	specified camshaft an- gle ratio > 2.75 [-] Or Ratio between measured segment time ratio and specified camshaft an- gle ratio < 2.25 1.1	400 – 8160 RPM	GRK Continuous	tha coffee has	 Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.11 Engine Speed Sensor G28, Checking", page 1121
	Camshaft Position (CMP) In- take Sensor Signal Ac- tivity Check	• Segment time value < 50 μs	• Engine speed 400 – 8,160 RPM	• 1,440.0° CRK • Continuous		
	Camshaft Position (CMP) In- take Sensor Out of Range	Offset be- tween cam- shaft and crankshaft < -79.0° CRK Offset be- tween cam- shaft and crankshaft > 15.0° CRK	 Engine synchronization not validated Failure by exhaust camshaft sensor detected 	• 450.0° CRK • Once / DCY		

	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
B tr	(nock Con- rol Func- on Check	and noise level in pre knock window > 3.50 - 5.0 [-] • For time >= 5,760.0 - 6,840.0° CRK • Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] • Ratio between knock sensor and knock sensor and knock threshold in main knock window > 20 - 3.0 [-] • For time >= 12,960.0 - 16,740.0° CRK	• Engine running • ~~ Signal (tco) > 60° C • Engine speed 1,216 – 6,400 RPM • Engine load not calibrated % • Air mass > 403.0 – 501.0 mg/stk • Dynamic engine speed not active • Delay time 0.0 seg			fer to appro- priate repair manual for low com- pression readings or	act to the correctness of info

Description Description Description Description
Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] Ratio between normalised engine roughness and mis-

D -6 :		1	, Olle	gen AG. Volkovi	-0//	
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P03A 5 Cylinder 2 Pressure Too High	Knock Control Function Check	tion: Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] For time >= 9,000.0 - 11,700.0 CRK Ratio between knock sensor and noise level in pre knock window > 3.50	 Engine speed 1,216 – 6,400 RPM Engine load not calibrated % Air mass > 403.0 – 501.0 mg/stk Dynamic engine speed not active Delay time 0.0 seg 	• 900.0° CRK • Continuous	• 2 DCY	 This DTC may set due to poor fuel quality or fuel that has aged excessively. If necessary, drain the fuel from the vehicle and replace with fresh fuel. Check the spark plugs visually for signs of fouling. Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61- Refer to a "3.6.21 Knock Sensor 1 G61. Checking", page 1141. Check the Engine Speed Sensor - G28- Refer to a "3.6.11 Engine Speed Sensor G28.

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DTC / De-	Monitor Strategy₅≎	Malfunction Criteria and Thresh-	Secondary Parameters with Enable	Monitoring Time	MIL Illumina- tion	Component Diagnostic Proce-
scrip-	Description	old Value	Conditions	L ength		dure
tion	, ob				^Q D ₁	
	Dorin	Fast detec- tion:	Engine running		abilities and a second	Checking", page 1121 .
	snot	tion:	• ~~ Signal (tco) >		N. With	page 1121.
	0/6,1		Fast detection: Ratio between knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-]		nrest	
	or in whole, is not be	and knock		spect.		
7		threshold in main knock	RPM		othe	
nba		window > 1.50 - 2.50 [-]	 Engine load not 		corr	
968,		-	calibrated %		ectn	
1400%		• For time >= 540.0° CRK	 Air mass > 403.0 - 501.0 mg/stk 		ess (
3	a a a a a a a a a a a a a a a a a a a	Ratio between	Misfire detection		of infa	
	mero	knock sensor	active		Orma	
	mos	and noise lev- el in pre knock	Dynamic engine		tioni	
	to all	window > 2.75	speed not active		This	
	JII OHO	- 4.50 [-]	Delay time 0.0			
	JOUIS CH	 For time >= 360.0° CRK 	seg	·1701	,	
	A holy of hive or commercial by	• 46Case 1:	9	"Pirdo, 2		
		Ratio between	Olygu Sylo	Kajn		
		filtered engine	. DA nagenia			
		roughness and misfire				
		detection				
		threshold <= 0.41 - 0.59 [-]				
		• Case 2:				
		Ratio between				
		normalised engine rough-				
		ness and mis-				
		fire detection threshold not				
		calibrated [-]				
		• Case 3:				
		Ratio between				
		filtered engine roughness				
		and misfire				
		detection threshold not				
		calibrated [-]				
		Ratio between normalised				
		engine rough-				
		ness and mis- fire detection				
		threshold not				
		calibrated [-]				

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions		MIL Illumina- tion olkswagen AG doe	Component Diagnostic Procedure	
P03A F Cylin-der 3 Pres- sure Too High	Knock Control Function Check	Ratio between knock sensor and noise level in pre knock window > 3.50	 Engine running ~~ Signal (tco) > 60° C Engine speed 1,216 – 6,400 RPM Engine load not calibrated % Air mass > 403.0 – 501.0 mg/stk Dynamic engine speed not active Delay time 0.0 seg 	• 900.0° CRK • Continuous	• 2 DCY	 This DTC may set due to poor fuel quality or fuel that has aged excessively. If necessary, drain the fuel from the vehicle and replace with fresh fuel. Check the spark plugs visually for signs of fouling. Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Knock Sensor 1 - G61 - Refer to ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141 Check the Engine Speed Sensor - G28 - Refer to ⇒ "3.6.11 Engine Speed Sensor G28 	000

DTC / De- poscription fiton - Fast detection: - Ratio between knock sensor and knock window > 1.50 - 501.0 mg/stk - Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] - For time >= 540.0 ° CRK - Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] - For time >= 360.0 ° CRK - Ratio between knock sensor and misfire detection threshold cetection threshold not calibrated [-] - Case 2: - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] - Case 3: - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] - Case 3: - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] - Ratio between normalised engine roughness and misfire detection threshold not calibrated [-]	Description terla and Threshold Value Fast detection: Ratio between knock sensor and knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 - 4.50 [-] For time >= 360.0° CRK Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold not calibrated [-]		ojise ^{OL}		dran		
and misfire detection threshold <= 0.41 - 0.59 [-] • Case 2: • Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] • Case 3: • Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] • Case 3: • Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] • Ratio between normalised engine roughness and misfire detection threshold not threshold not threshold not	and misfire detection threshold <= 0.41 - 0.59 [-] • Case 2: • Ratio between normalised engine rough- ness and mis- fire detection threshold not calibrated [-] • Case 3: • Ratio between filtered engine roughness and misfire detection threshold not calibrated [-]	De- scrip-	Monitor Strategy Description	teria and Thresh- old Value	ters with Enable	Time tion	agnostic Proce-
	normalised engine rough- ness and mis- fire detection	or commercial purposes, in part or in whole, is not being the commercial purposes, in part or in whole, is not being the commercial purposes, in part or in whole, is not being the commercial purposes.	3. Elifado 7. H. Elifadoo,	and misfire detection threshold <= 0.41 – 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] Ratio between normalised engine roughness and misfire detection threshold not calibrated [-]	 ~~ Signal (tco) > 60° C Engine speed 1,216 – 6,400 RPM Engine load not calibrated % Air mass > 403.0 – 501.0 mg/stk Misfire detection active Dynamic engine speed not active Delay time 0.0 seg 	o the correctness of information in this of our	

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DTC / De- Strategy Scription	omponent Di- nostic Proce- dure
P03B Knock Control Function Check der 4 Pressure Too High Ratio between knock sensor and knock window > 2.0 - 3.0 [-] For time >= 9,000.0 - 6,840.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] For time >= 5,760.0 - 6,840.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] For time >= 5,760.0 - 6,840.0° CRK Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] Ratio between knock sensor and knock threshold in main knock window > 2.0 - 3.0 [-] Ratio between knock sensor and noise level in pre knock window > 2.0 - 3.0 [-] Ratio between knock sensor and noise level in pre knock window > 2.0 - 3.0 [-] Ratio between knock sensor and noise level in pre knock window > 2.0 - 3.0 [-] Ratio between knock sensor and noise level in pre knock window > 2.0 - 3.0 [-] Ratio between knock sensor and noise level in pre knock window > 2.0 - 3.0 [-] Ratio between knock sensor and noise level in pre knock window > 2.0 - 3.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and noise level in pre knock window > 3.50 - 5.0 [-] Ratio between knock sensor and	This DTC may set due to poor fuel quality or fuel that has aged exces- sively. If nec- essary, drain the fuel from the vehicle and replace with fresh fuel. Check the spark plugs visually for signs of foul- ing. Check for an engine me- chanical fault with a cylin- der compres- sion test. Carbon buildup may cause a high- er than nor mal com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and may contrib- ute to this concern. Refer to appro- priate repair manual for low com- pression reading and

 Fast detection: Ratio between knock sensor and knock threshold in main knock window > 1.50 – 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 Ratio between knock sensor and noise level in pre knock window > 2.75 For time >= 0.0 Delay time 0.0 seg 	DTC / Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 − 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] Ratio between normalised	Copyright or in part or in whole, is not be sent or in whole is not being the part of the part of in whole is not being the part of in whole in which is not being the part of i	tion: Ratio between knock sensor and knock threshold in main knock window > 1.50 - 2.50 [-] For time >= 540.0° CRK Ratio between knock sensor and noise level in pre knock window > 2.75 (-) For time >= 360.0° CRK Case 1: Ratio between filtered engine roughness and misfire detection threshold <= 0.41 - 0.59 [-] Case 2: Ratio between normalised engine roughness and misfire detection threshold not calibrated [-] Case 3: Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] Ratio between filtered engine roughness and misfire detection threshold not calibrated [-] Ratio between filtered engine roughness and misfire detection threshold not calibrated [-]	 ~~ Signal (tco) > 60° C Engine speed 1,216 – 6,400 RPM Engine load not calibrated % Air mass > 403.0 – 501.0 mg/stk Misfire detection 	derantee of accepta	Niepliny with respect to the correctness of information in this co	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
AIR Sys- tem "A"	Secondary Air Injection (AIR) Functional Check	Diff. pressure value after secondary air injection vs. pressure value before secondary air activation > 5.0 kPa Althorised by Volkswagen Barrised by Volkswagen Althorised by Volkswagen Barrised by Vo	 General: AIR pump ready Catalyst heating active AIR finished MAF <= 140.0 kg/h ~~ Signal (tco) >= -10; < 115° C IAT @ manifold >= -10; < 100° C Modeled catalyst temperature < 700° C Relative barometric pressure > 0.73 [-] PAG does no Diff. BARO vs. MAP not calibrated kPa Engine not calibrated Engine not calibrated 	• 0.1 s • Once / DCY	• 2 DCY	- Check the Secondary Air Injection Sensor 1 - G609 Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609. Checking", page 1159 Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101. Checking", page 1157 Check the Secondary Air Injection Solenoid Valve - N112 Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112. Checking", page 1163 Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24. Checking", page 1165.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0413 AIR System Switc hing Valve "A" Circuit Open	Secondary Air Injection (AIR) Valve Open Cir- cuit	Output voltage lower range >= 1.92 - 2.21 V Output voltage upper range <= 2.85 3.25 V Output voltage < 1.92 - 2.4 V	• Engine running • Actuator commanded off	• 0.5 s • Continuous	· 2 DCY	- Check the Secondary Air Injection Solenoid Valve - N112- Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112 Checking", page 1363 . - Check the Secondary Air System - GX24 - Refer to ⇒ "3.6.32 Secondary Air System GX24 Checking", checking", air System GX24 Checking", checking
P0414 AIR System Switc hing Valve "A" Circuit Shorted	Secondary Air Injection (AIR) Valve Short To Ground Secondary Air Injection (AIR) Valve Short To Battery Plus	 Output voltage < 1.92 – 2.21 V Actuator temperature > 160 – 200° C Or Output current > 4.0 – 7.0 A 	 Engine running Actuator commanded off Engine running Actuator commanded on 	• 0.5 s • Continuous	• 2 DCY	page 1165. - Check the Secondary Air Injection Solenoid Valve - N112 - Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163. - Check the Secondary Air System - GX24 - Refer to ⇒ "3.6.32 Secondary Air System GX24, Checking", page 1165.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
AIR Sys-	Secondary Air Injection (AIR) Pump Relay Open Circuit	Output voltage lower range 1.92 – 2.21 V Output voltage upper range <= 2.85 – 3.25 V	manded off	• 0.5 s	• 2 DCY **Cook to the correctness of information in this country. **Cook to the correctness of information in this country. **Cook to the correctness of information in this cook to the correctness of the co	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101 . Checking", page 1157 .
	Applinate or commercial	Sundo ya patoati	wagen AG. Pro	SMOV Kaliteinggo	information in this old the pir	

De- St	lonitor trategy scription	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Cata- Sysing Sys- NMI tem NOX Effi- versionery Below	tiem OGG / HC / X Considity	 Arithmetic average Catalyst efficiency not calibrated [-] EWMA filtered Catalyst efficiency not calibrated [-] Arithmetic average, corrected with measured delay and transition time of oxygen sensors rear Catalyst efficiency > 1.0]-] EWMA filtered, corrected with measured delay and transition time of oxygen sensors rear Catalyst efficiency not calibrated [-] 	O2S front ready		• 2 DCY	sor 1 After Catalytic Converter - GX7 Refer

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time A.G.Length	MIL Illumina- tion	Component Diagnostic Procedure
			Coasting function		Tonot guara	ntee Or
		, ob ³	Lambda adaptation not active		7	accept du
		010 Mil	 Valve lift not equipped 			lab littly
		hole, ist.	 Temperature conditions: 			Jith resp
		t or in w	• ~~ Signal (tmot) > 60° C			The of acceptany liability with respect to the co
		ss, in par	 ~~ Signal (tans) > -48° C 			Scorrect
		ercial purpose	 Modeled catalyst temperature once after engine start > 550° C 			ness of Inforn
		or on whole, is not be milling to the second	Modeled catalyst temperature @ start of diagnosis 500 – 700° C			ation in this oo
		Ť,	temperature dur- ing diagnosis 470 – 730°, C		JOA Kay	Olly GOO, Hayin
			Integrated air not calibrated air not calibrated air not calibrated g	.ŕ	A negen square	offociness of information in this ood the state of the st
			 Diff. between dy- namic and sta- tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K 			
			 Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K 			
			 Modeled EGT @ O2S rear <= 1,201° C 			
			 Air mass conditions: 			
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/stk 			
			 Air mass during diagnosis not calibrated mg/stk 			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
nercial purposes, in part or in whole is	The state of the s	Gundoo Agpapapold	 MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h MAF per cylinder during diagnosis 35.0 – 135.0 kg/h Load conditions: Air mass set point 125.01 – 580.0 volking/stk Engine load not calibrated % Accelerator pedal value not calibrated % For time >= 0.0 s Low dynamic conditions: Dynamic engine speed < 20 RPM Dynamic lambda controller output < 20.0% Integrated air mass after dynamic conditions are fulfilled > 20.0 g Evap purge conditions are fulfilled > 20.0 g Evap purge valve not calibrated Case 2 Canister load calculation not calibrated Evap purge flow not calibrated Evap purge flow not calibrated Case 3 Canister load not calibrated Case 3 Canister load not calibrated Close the gap conditions: 	Thee or acceptant.	with respect to the correctness of information in the	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			O2S rear voltage @ diagnosis start >= 0.55 V			
			 Integrated air mass @ start di- agnosis >= 0.0 g 			
			 O2S front dynamic diagnosis separate not active 			
			For arithmetic average value nac calculation:	. Volkswagen A	G does not guara	
		_{zo} dun ^e	• Number of checks required for valid result >= 2.0 [-]		dnie	e or accept
		illus de la companya	For EWMA-filter:			lab _{III}
		in whole, is not,	 Minimum number of tests per DCY required not cali- brated 			Nwith respect
		ses, in part or	 Step change de- tection will initiate multiple tests per DCY 			o the correctn
		yroial purpo	 Conditions for step change de- tection: 			ess of infon
		orto whole, is not be milled the purposes, in part or in whole, is not be milled the purposes. In part or in whole, is not be milled the purposes. It is not be milled to be m	 @ diagnosis start >= 0.55 V Integrated air mass @ start diagnosis >= 0.0 g O2S front dynamic diagnosis separate not active For arithmetic average value calculation: Number of checks required for valid result >= 2.0 [-] For EWMA-filter: Minimum number of tests per DCY required not calibrated Step change detection will initiate multiple tests per DCY Conditions for step change detection: Relative deviation between new measured value and old EWMA filtered value not calibrated [-] Number of checks not calibrated [-] Number of checks not calibrated [-] 			mation in this co
		*	Number of checks not calibrated [-]		ight by Volkswago	idoo *

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P043 E EVAP System Leak Detection Reference Orifice Low Flow	Evaporative Emission (EVAP) Out Of Range High	current during	 BARO > 73.0 kPa AAT 4 - 38° C ECT @ start >= AG. 49 Gwagen AG does with two factors wit	• Once / DCY	• 2 DCY 2 DCY 2 DCY 3 DCY 4 DCY 5 DCY 5 DCY 5 DCY 5 DCY 6 DC	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking". page 1143 .
P043 F EVAP Sys- tem Leak De- tion Refer- ence Orifice High Flow	Evaporative Emission (EVAP) System Out Of Range Low	• Evap pump current during reference measurement < 15.0 mA	 BARO > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) Airbag not activated 	• 624.0 s • Once / DCY	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144. Checking", page 1143.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0441 EVAP Sys- tem Incor- rect Purge	Evaporative Emission (EVAP) Canister Purge Valve Func- tional Check: Stuck Close	intake mani- fold pressure and modeled set point in- take manifold pressure < 0.05 [-]	 ~~ Signal (tco) > 58° C BARO > 73.0 kPa AAT > 5° C AAT @ start >= 5° C Diff. BARO vs. filtered MAP >= 33.0 kPa Diff. BARO vs. filtered MAP > 33.0 kPa Engine speed < 2,200 RPM Ratio MAF @ manifold and MAF max > 0.07 - 0.09 [-] Engine speed < 1,180 RPM 	• 8.5 s • Once / DCY	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123. - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
		n part or in whole, is not he	 Coasting function not calibrated Vehicle speed >= 5 km/h Diff. engine speed < 90 RPM Diff. ratio MAF @ manifold and MAF max vs. ratio filtered MAF @ manifold and MAF max < 0.15 [-] Diff. modeled MAP vs. filtered modeled MAP < 	agen AG. Volks	wagen AG does no	guarantee or accept and liability with the
		or commercial purposes, in part or in whole, is now	1.50 kPa Integrated air mass since engine start >= 0.0 – 5,000.0 g Lambda conditions fulfilled Lambda control active Lambda control value -30.0 – 30.0% O2S front 0.95 – 1.05 [-]	eio19	Jkewagen AG.	Walter Mills of the Market of

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
LIGHT		$ho(e,isn_{O_Q^{i_{O_{O_Q}}}})$	 Fuel cut off not calibrated Case 1: Integrated air mass @ canister purge valve per driving cycle not calibrated g Case 2: Ratio MAF @ canister purge and MAF per cylinder >= 0.0 [-] Canister purge sampling rate >= 40.0% Integrated air mass @ canister purge valve >= 2.1 g Depending on AAT: AAT >= 20° C Canister load <= 0.17 [-] Or AAT >= 30° C Canister load <= 0.17 [-] AAT < 30° C Canister load <= 0.17 [-] 	agen A.G. Volks	wagen AG does no	9 Ouarantee or acceptantiability	in the special states of the s
		orcommercial purposes, in part or in	• AAT < 30° C • Canister load <= 0.17 [-]	a ploid	3. Diag	nosis and Testing 8	to the correctness of information.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0442 EVAP System Leak Detected (Small Leak)	l Eminaian	numn aurrant	 Barometric pressure > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Volkswagen A Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) 	• Once / DCY	• 2 DCY	- Check the EVAP System for Leaks. Refer to ⇒ "2.2.4 EVAP System, Checking for Leaks", page 6 - Check the EVAP Canister Purge Regulator Valve 1 - N80 - Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80 - Checking", page 1123 - Check the
oduna lo:-	Evaporative			di	ess of information in this oo	Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143
	Evaporative Emission (EVAP) Canister Purge Valve Open Circuit	Output voltage lower range >= 1.92 - 2.21 Value output voltage upper range <= 2.85 - 3.25 V	 Engine start not active Engine running Evap purge valve opening signal (PWM) > 3.13; <= 98.83% Actuator commanded off 	• 2.0 s Continuous	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 . - Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0445 EVAP Sys- tem Purge Con- trol Valve "A" Circuit Shor- ted	Emission (EVAP) Canister	Output volt- age (hard- ware values) 1.92 – 2.21 V	 Engine start not active Engine running Evap purge valve opening signal (PWM) <= 98.83% Actuator commanded off 	2.0 sContinuous	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80,
	Evaporative Emission (EVAP) Canister Purge Valve Short To Battery Plus	 Actuator temperature > 160 - 200° C Or Output current > 4.0 - 7.0 A 	 Engine start not active Engine running Evap purge valve opening signal (PWM) >= 3.13% Actuator commanded on 			Checking", page 1123
P0447 EVAP Sys- tem Vent Con- trol Circuit Open		Output voltage lower range 1.85 – 2.28 V Output voltage upper range 2.85 – 3.25 V	Actuator commanded off Manded off AG. Volkswa By Volkswagen AG. Volkswa By Volkswagen AG. Volkswagen By Volkswagen	 2.0 s Continuous gen AG does no 	* 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143
P0448 EVAP Sys- tem Vent Con- trol Circuit Shor- ted	Evaporative Emission (EVAP) Leak Detection Pump (LDP) Short To Ground Evaporative Emission (EVAP) Leak Detection Pump (LDP) Short To Battery Plus	• Output volt- age (hard- ware values) < 1.92 – 2.21 V		2.0 sContinuous	• 2 DCY	- Check the Leak Detection Pump - V144- Refer to 3 3.6.22 Leak Detection Pump V144 Checking", page 1143
EVAP Sys- tem Leak De-		 Difference pump current vs. small leak reference current < 0.0 mA Pump current measurement time > 600.0 s Pump current gradient >= 0.30; <= 0.01 mA/s 	 Barometric pressure > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s 	• 624.0 s • Once / DCY	· 2 DCY	- Check the EVAP System for Leaks. Refer to

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Pump current gradient < 0.002 mA/s	Difference be- tween ECT and AAT @ start not calibrated K			ter Purge Regulator Valve 1 - N80 Refer
		Difference pump current vs. small leak reference cur- rent >= 0.0	Propulsion off time >= 21,600.0 sEvap purge			to ⇒ "3.6.12 EVAP Canis- ter Purge Regulator
		mA • And	adaptation < 0.30	l		Valve 1 N80 , Checking",
		• Pump current gradient < 0.002 mA/s	Engine stop (during ECM keep Nage alive-time)	n AG. Volkswa	gen AG does not gu	- Check the Leak Detec-
		small leak reference pump current < 1/10 [-]	Buriles 5 de			to 3.6.22 ⇒ "3.6.22 Leak Detection Pump V144 . Checking". page 1143 .
		pump current vs. small leak reference cur- rent >= 0.0 mA Pump current				ect to the concess of infor
		gradient>= 0.30; <≅0.01 mA/s				40
		to to aleni	Adoling Copyright, Copyright of the Polysia of the			Quedindo Transpoor
			otected by copyright, Copy.	rW	y Volkswagen AG.	Copyight

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
AIR Sys- tem Insuf- ficient	Secondary Air Injection (AIR) Functional Check	 Case 1: For 1.8L: Blockage: Ratio relative measured secondary air pressure [tube blocked] < 0.51 [-] For 2.0L: Blockage: Ratio relative measured secondary air pressure and modeled secondary air pressure [tube blocked] < 0.65 [-] Leakage: Ratio relative measured secondary air pressure [leak diagnosis] < 0.51 [-] Case 2: Diff. expected integrated secondary air pressure pulsations and actual integrated secondary air pressure pulsations not calibrated kPa/s	General: AIR pump active Catalyst heating active AIR active AIR active MAF <= 140.0 kg/h ~~Signal (tco) >= -10; < 115° C IAT @ manifold >= -10; < 100° C Modeled catalyst temperature < 700° C Relative barometric pressure > 0.73 [-] Diff. BARO vs. MAP not calibrated kPa Engine not calibrated where the control of th	• O.1 s • Once / DCY	• 2 DCY	- Check the Secondary Air Injection Sensor 1 - G609- Refer to ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609 Checking", page 1159 . - Check the Secondary Air Injection Pump Relay J299- / Secondary Air Injection Pump Motor - V101- Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101 Checking", page 1157 . - Check the Secondary Air Injection Solenoid Valve - N112- Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112 Checking", page 1163 . - Check the Secondary Air System - GX24- Refer to ⇒ "3.6.32 Secondary Air System GX24 Checking", page 1165 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Leakage: Ratio relative measured secondary air pressure and modeled secondary air pressure [leak diagnosis] < 0.03 [-]				
P0501 Vehi- cle Speed Sen-	COM: Vehi- cle Speed Sensor (VSS) Com- munication	Speed sensor fault value: out of range high failure		• 0.5 s • Continuous	• 2 DCY	- Check the vehicle speed signal. Refer to ⇒ "3.6.36 Ve-
sor "A" Circuit Rang e/Per-	With VSS	Speed sensor fault value: out of range low failure				hicle Speed Signal, Checking", page 1174.
for- manc e		Speed sensor fault value: ra- tionality check high failure				Check the CAN-Bus terminal resistance. Refer to
		Speed sensor fault value: ra- tionality check low failure				≅ "3.6.5 CAN- Bus Terminal Resistance, Checking", page 1109
Vehi- cle Speed Sen-	Vehicle Speed Sen- sor (VSS) Short To Ground	Diagnostic signal from output driver failure	_{sed} by Volkswagen AG. Volks	• 0.5 s	• 2 DCY	 Check the vehicle speed signal. Refer to ⇒ "3.6.36 Ve-
sor "A" Circuit Low	Vehicle Speed Sen- sor (VSS) Open Cir- cuit	seiledunese aum.			not guarantee or acce	hicle Speed Signal, Checking", page 1174
	Vehicle Speed Sen- sor (VSS) Short To Battery Plus	rin whole, is not				CAN-Bus terminal re- sistance. Re- fer to
	,	poses, inpart o				3.6.5 CAN- Bus Terminal Resistance, Checking", page ₹109
		e or commercial pu	Bundoon appayord			page 3 109 .
		*EALER PORTUGO WIL		9	ari Cophidoo jak	Jura St.
878	Rep. Gr.ST - G	eneric Scan Tool	Protected by	.DA nagen.	ONNOWN	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0506 Idle	Idle Speed Control	Diff. actual engine speed vs.	General conditions:	• 10.0 s	• 2 DCY	 Check the Throttle
Con- trol Sys-	(ISC) Function Monitoring: En-	engine speed set point < -100 RPM	Vehicle speed 0 km/h	Continuous		Valve Con- trol Module - GX3 Refer
tem RPM - Lower	gine Speed Deviation	Integrated I- part of idle speed control-	Accelerator pedal released by driv- er			to ⇒ "3.6.34 <u>Throttle</u>
Than Ex- pec- ted		ler not calibra- ted	Throttle actuator commanded on			Valve Control Module GX3, Checking",
loa			• Evap purge flow < 8.0 kg/h			page 1169.
			Engine running			
			• Time after engine start > 0.0 s			
			Clutch switch not calibrated			
			Barometric pres- sure > 70.0 kPa			
			Catalyst heating not active			
			• ~~ Signal (tco) > -48° C			
			Set point change not calibrated RPM			
		ised by Volkswagen Ar	For time not caling brated s	Waran		
	aduniessau	norised by Volkswagen Ar	not calibrated RPM For time not calibrated s Additional after dynamic conditions fulfilled:	TICE OF RICEPIE		
	ot permit		Gear switch not active		X liab lility	
	3, is no		• (A/T only)		WithTo	
Orinwa	201		Accelerator pedal released by driv- er		to the correctness of information, and liability with respect to the correctness of information,	
s, inpart			Vehicle speed 0 km/h		le correc	
ourpose			• Engine load < 30.47%		tnessof	
10:0	200		• (M/T only)		infor	
	E		• For time >= 0.0 s		nation	
	o Sealed of Editado	Protected by copyright.	. DA negenealo	Kalilehigoo, jilalif	10 th 60 cm	
		Protectedby	Jolkswagen AG.	<u> </u>		
					3. Diag	nosis and Testing
					3	3

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Idle Con- trol Sys- tem RPM - High- er Than Ex- pec- ted	Idle Speed Control (ISC) Function Monitoring: Engine Speed Deviation	Diff. actual engine speed vs. engine speed set point > 200 RPM Integrated I-part of idle speed controller not calibrated sauthorized by Volkswags authorized by	 General conditions: Vehicle speed 0 km/h Accelerator pedal released by driver Throttle actuator commanded on Evap purge flow < 8.0 kg/h Engine running Time after engine start > 0.0 s Clutch switch not calibrated Barometric pressure > 70.0 kPa Catalyst heating not active AG. Volkswagen AG. Volkswag	• 10.0 s • Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169.
	Word of Di	Thato ingitado Va beisedo	A DA negewa	MoVed Might by Volk	_{Lit} a _{Lit} os	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P050 A	Cold Start Monitoring	 Diff. actual en- gine speed vs. 	General conditions:	• 10.0 s	• 2 DCY	 Check the Throttle
Cold Start Idle	Idle Speed Control (ISC) Func-	engine speed set point < -100 RPM	engine speed set point <		Valve Con- trol Module - GX3 Refer	
Con- trol Sys- tem	tion Moni- toring: En- gine Speed Deviation	 Integrated I- part of idle speed control- 	Accelerator pedal released by driv- er			to <u>⇒ "3.6.34</u> <u>Throttle</u> Valve Con-
Per- for-		ler not calibra- ted	Throttle actuator commanded on			
manc e			• Evap purge flow < 8.0 kg/h			<u>ing ,</u> page 1169 .
			Engine running			
			Time after engine start > 0.0 s	wagen AG does	not ou.	
		sauthori	Clutch switch not calibrated		adarantee Orac	
			Barometric pres- sure > 70.0 kPa		CCE	OF PANY
		notoem	Catalyst heating active			Mability W.
		thole, is,	• ~~ Signal (tco) > -10° C			threspe
		commercial purposes, in part or in whole, is not be missing any and a series as a series and a series as a series as a series and a series as a series	Set point change not calibrated RPM			trol Module GX3, Checking", page 1169.
		coses, ii	 For time not cali- brated s 			rectnes
		nercial purp	Additional after dynamic condi- tions fulfilled:			s of informa
		mos vo a	Gear switch not active			tioninth
		*BAILED	• (A/T only)			S QQ
		JOHNAOS WAR	tions fulfilled: Gear switch not active (A/T only) Accelerator pedal released by driver Vehicle speed 0 km/h equal	9	ighydog.ing	5.
		70	• Vehicle speed 0 km/h ^{lo∋} lol _d	DA nagenes.	MoVeding	
			• Engine load < 30.47%			
			• (M/T only)			
			• For time >= 0.0 s			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring en A Time Length	MIL Illumina- gen A tion es not g	Component Diagnostic Procedure
		Diff. actual engine speed vs. engine speed set point > 200 RPM Integrated part of idle speed controller not calibrated integrated part of idle speed controller not calibrated	 Vehicle speed 0 km/h Accelerator pedal released by driver Throttle actuator commanded on 		7	JOHN O THE HEAD OF

norbo	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
orcommercial purposes, in part or in whole, is no	P050 B Cold Start Ignition Timing Performance	Strategy Description Cold Start Monitoring Ignition Control (IC) Ignition Timing Monitor	• Ratio between ignition angle efficiency integral and time at idle speed > 0.20 [-]	 Engine idle speed Ignition angle efficiency set point <= 0.80 [-] Modeled pressure quotient <= 1.0 [-] Barometric pressure > 73.0 kPa Catalyst heating active Engine start temperature 5 – 45° C Time after engine start > 2.0 s Vehicle speed 0 Vehicle speed 0 Itered air mass set point vs. filtered air mass set point for load dynamic detection < 99,999.0 mg/stk For time >= 0.0 s Diff. engine speed for engine speed dynamic detection < 8,160 RPM For time >= 0.0 s 	• Once or or of information in this or	• 2 DCY	 Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169. Check for any engine speed sensor or ignition coil faults and diagnose them first. If no other codes are set, replace the Engine Control Module - J623 Refer to appropriate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Cold Start Monitoring Variable Valve Tim- ing (VVT) Intake Ac- tuator Ra- tionality Check	For 1.8L: Camshaft position deviation > 9.0° CRK For 2.0L: Camshaft position deviation > 9.90° CRK	 Modeled oil temperature -40 – 160° C Engine speed 608 – 6,016 RPM Camshaft position not calibrated Camshaft position adjustment active Catalyst heating active Camshaft position deviation integrator (actual vs. set point position) >= 9.0° CRK*s 		• 2 DCY	- Check engine oil for incorrect viscosity or in need of servicing (dirty oil). Oil that is not clear in color may be causing the sensor to operate incorrectly. The engine oil must be clean and of the correct viscosity in order for the sensor to operate properly. Check the vehicle paperwork to determine what oil viscosity has been used and when the last oil change was performed. Change the engine oil if necessary. - Check the Camshaft Adjustment Valve 1 - N205 - Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 - Check the fuel pressure of the correct of the complete of the complete oil if necessary.
P053 F Cold Start Fuel Pres- sure Per- for- manc e Bank 2	Cold Start Monitoring Fuel Sys- tem Out Of Range Low	Deviation between set point and actual fuel pressure > 1,500.2 kPa For time >= 3.0 s	start > 3.0 s • Fuel mass set point lower range > 1.99 mg/stk • For time >= 5.0 s	• 5.0 s • Once / DCY	• 2 DCY	and delivery quantity. Refer to fuel system me chanical testing in 9 3.1 Pre-

			uthoris			*Meo
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Di-
	Cold Start Monitoring Fuel Sys- tem Out Of Range High	Deviation between set point and actual fuel pressure < -1,500.2 kPa For time >= 3.0 s	• Fuel mass set point upper range <= 100.32 - 172.41 mg/stk Fuel mass set point gradient -1,389.0 - 2.2 mg/stk For time >= 1.2 s Additional for cat- alyst heating: • Catalyst heating active • ~ Signal (tco) > -48° C • Fuel mass set point lower range >= 5.0 mg/stk • For time >= 3.0 s	Protectedby	. ĐA na	dure - Check the Fuel Pressure Sensor G247 Refer to ⇒ "3.6.16 Fuel Pressure Sensor G247, Checking", page 1131. - Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve - N276 Refer to
Tur- bo-	Turbo- charger (TC) Boost Pressure Control Cold Start Functional	 Boost pressure actuator position controller output > 98.0% Boost pressure 	 Time after engine start >= 4.0 s ECT > -10° C AAT > -10° C Catalyst heating 	0.4 s Continuous	• 2 DCY	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Ac-
er/Su- per-	Check - Slow Re- sponse	sure actuator position con- troller output < -98.0%	active			tuator V465, Checking", page 1113.
Con- trol "A" Per- for- manc e	Turbo- charger (TC) Boost Pressure Control Cold Start Functional Check	Deviation boost pres- sure actuator position con- troller > 16.0 – 100.0%	 Time after engine start >= 4.0 s ECT > -10° C AAT > -10° C Diff. between actuator position set point in normal mode and during catalyst heating > 0.0% Catalyst heating active Boost pressure control active 			Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249. Checking". page 1172. Check the Charge Air Pressure Sensor - G31 Refer to ⇒ "3.6.8 Charge Air
						Pressure Sensor G31, Checking", page 1115.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P05A 0 Active Grille Air Shut- ter "A" Stuck On	Active Grille Air Shutter Functional Check	tive grille air shutter detec- ted	 Case 1 AAT >= 5° C Case 2 ECT > 125° C AAT <= 5° C 	0.6 s Continuous	• 2 DCY	- Check the Radiator Shutter Mo- tor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Mo- tor V544 ,
		Uncontrolled adjustment detected		• 0.3 s • Continuous		Checking", page 1155
P05A 2 Active Grille Air Shut- ter "A" Con- trol Cir- cuit/ Open	Active Grille Air Shutter Open Cir- cuit	 Signal voltage lower range > 1.92 - 2.21 V Signal voltage upper range < 2.85 - 3.25 V 		• 0.5 s • Continuous	• 2 DCY	- Check the Radiator Shutter Motor - V544 - Refer to ⇒ "3.6.27 Radiator Shutter Motor V544 , Checking", page 1155 .
P05A 3 Active Grille Air Shut- ter "A" Con- trol	Active Grille Air Shutter Functional Check	Internal logic failure detected Initialisation failure detected		0.3 s Continuous 0.0 s Continuous	• 2 DCY	- Check the Radiator Shutter Motor - V544 Refer to ⇒ "3.6.27 Radiator Shutter Motor - W544 .
Circuit Rang e/Per- for- manc e	Active Grille Air Shutter Activity Check	Active grille air shutter controller feedback sig- nal failed	dille dinless dutro	, W		Checking", page 1155
P05A 4 Active Grille Air Shut- ter "A" Con- trol Circuit High	Active Grille Air Shutter Short To Battery Plus	 Power stage temperature > 160.0 - 200.0° C Signal current > 4.0 - 7.0 A 	wposes, in part or in whole, is not be seen in part or in whole, is not be seen in the see	• 0.5 s • Continuous	• 2 DCY	- Check the Radiator Shutter Motor - V544 - Refer to ⇒ "3.6.27 Radiator Shutter Motor V544 , Checking", page 1155 .
P05A 5 Active Grille Air Shut- ter "A" Con- trol Circuit Low	Active Grille Air Shutter Short To Ground	• Signal voltage < 1.92 – 2.21 V	Recording time of signal voltage > 3.3 s Active grille air shutter feedback failure not detected	• Continuous	• 2 DCY	- Check the Radiator Shutter Motor - V544 - Refer to ⇒ "3.6.27 Radiator Shutter Motor V544 , Checking", page 1155

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P05C 0 Active Grille Air Shut- ter Mod- ule "A" Over Tem- pera- ture	Active Grille Air Shutter Functional Check	Internal over- voltage detec- ted Internal over- temperature detected		• 0.3 s • Continuous	• 2 DCY	- Check the Radiator Shutter Motor - V544- Refer to ⇒ "3.6.27 Radiator Shutter Motor V544, Checking", page 1155.
P0601 Inter- nal Con- trol Mod- ule Mem- ory Check sum Error	Engine Control Module (ECM): Checksum Verification	Calibration checksum incorrect Software checksum incorrect	Stolected by copyright, Copyright	• 1.0 s • Continuous	• 2 DCY	- Replace the Engine Control Module - J623 Refer to appropriate repair manual.
P0603 Inter- nal Con- trol Mod- ule Keep Alive Mem- ory (KAM) Error	Engine Control Module (ECM): Communi- cation Check	 Device 1: SPI communication with ATIC failure Device 2: SPI communication with ATIC failure SPI communication with ATIC failure 		2.0 sContinuous	• 2 DCY • 1 DCY	Replace the Engine Control Module - J623 Refer to appropriate repair manual.
	Engine Control Module (ECM): Fuel Injection Valves In- ternal Hard- ware Check	Time reference from microcontroller during initialization failure Hardware during initialization failure Calibration during initialization failure Hardware vs. software vs. software version check during initialization failure		• 4.9 s • Once / DCY	• 2 DCY	

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Control Module Processor	Barometric Pressure (BARO) Sensor Engine Standing: Cross Check	 Case 1: charged engine Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa Case 2: non charged engine Diff. BARO mean value vs. MAP mean value vs. MAP mean value (MAP mean value (MAP mean value BARO mean value BARO mean value time and MAP @ ECM keep alive time and MAP @ ECM keep alive time) not calibrated kPa Diff. deviation MAP mean value, BARO mean va	 Case A: engine stop during DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle not calibrated For time >= 10.0 s Case B: engine stop @ start of DCY Engine stopped Vehicle speed < 1 km/h Engine @ driving cycle not calibrated 	• 3.0 s • Continuous AG does not gu	a 2 DCY	Replace the Engine Control Module - J623 Refer to appropriate repair manual.
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DTC / De- scrip-	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
tion	Barometric Pressure (BARO) Sensor ECM Keep Alive-Time: Cross Check	Diff. BARO vs. MAP > 7.50 kPa Diff. BARO vs. turbocharger boost pressure > 7.50 kPa	 Vehicle speed < 1 km/h 			
	Barometric Pressure (BARO) Sensor Out Of Range Low	Measured barometric pressure < 45.0 kPa		• 5.0 s • Continuous		
	Barometric Pressure (BARO) Sensor Out Of Range High	Measured barometric pressure > 115.0 kPa				
	Knock Control Functional	Knock control failure moise	• Engine running	• 6.4 s		
ľt or in	Engine Control Module (EGM): An- alog / Digital Converter Function Monitoring: A/D Con- verter	• Diff. A/D- channel 1 vs. A/D channel 2 > 0.30 V		• 0.5 s . Continuous	and liability with respect to the correctness of information in this occ	
ad untrooses, in pa	Engine Control Module (ECM): Communi- cation Check	SPI communication with ATIC implausible SPI communication with	• Time after ignition on >= 1.0 s	• 10.0 s • Continuous	correctness of info _m	
	Engine Control Module (ECM): EE- PROM Check	EEPROM information failure		• 1.0 s • Continuous uous	"alion in this Coop,	

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Communication between sample software and production hardware error Finished NVMCrypt integrity error Decryption of NVMCrypt failed		• 1.0 s • Once / DCY		Mith respect to the correctness of information in this ook
	Engine Control Module (ECM): Electronic Throttle Control Module Function Monitoring: A/D Converter	Internal check failed Toppy of the chec	Protected by copyright	• 0.5 s • Continuous	Wesho Ved Mesw	Hadilloo
	Engine Control Module (ECM): Electronic Throttle Control Module Function Monitoring:	 Monitoring of difference between actual and set point torque value Engine torque overflow > 45.0 - 350.0 Nm 	Actuator com- manded on			
	Torque	 Monitoring of torque differ- ence integra- tion Integrated en- gine torque > 550.0 Nms 		0.01 s Continuous		
	Engine Control Module (ECM): Electronic Throttle Control Module Function Monitoring: Engine Speed Limitation	• Engine speed > 1,760 RPM	 Engine speed limitation active Injection active 	• 0.5 s • Continuous		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Di- agnostic Proce- dure
	Engine Control Module (ECM): RAM Func- tional Check		art orinwhole, isnotoe	0.5 s Continuous		
	Engine Control Module (ECM): RAM Inter- nal Hard- ware Check	RAM error de- tected	Microcontroller failure Reset counter > 1.0 [-]	• 0.04 s • Once / DCY		
P0607 Con- trol Mod- ule Per- for-	Barometric Pressure (BARO) Sensor Short To Ground	Barometric pressure sen- sor voltage < 0.20 V	BEEFOO TO STROWN OF THE STROWN	0.5 s Continuous	• 2 DCY	- Replace the Engine Control Module - J623 Refer to appropriate repair manual.
manc e	Barometric Pressure (BARO) Sensor Short To Battery Plus	Barometric pressure sen- sor voltage > 4.80 V	Montdo	Protectedby		gewexlov varn.
P0634 Control Module Internal Temperature "A" Too High	Turbo- charger (TC) Boost Pressure Control Over Tem- perature	Bypass valve driver temper- ature > 170 – 190° C	Actuator com- manded on	Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
Throt-	Throttle Actuator Adaptation Value Monitoring	Battery volt- age <= 9.04 V	Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error) active Throttle adaptation (@ initial start or after detection of throttle exchange or checksum error)	Once per life-time	• 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
ovi to the second purposes, in part or in whole, is not be the second purposes.	Throttle Actuator Monitoring Of Position	 ECT down-stream engine < 5° C ECT down-stream engine > 120° C Actual TPS - ref. point > 0.503° TPS Actual TPS 1 or 2 voltage - voltage ref. point > 0.07 V Actual TPS - ref. point > 0.503° TPS 	 Accelerator pedal value < 99.9% Vehicle speed < 2 km/h IAT @ throttle > 5° C ~~ Signal (tco) 5 – 120° C 	Once on the sect to the sect		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Actual TPS - ref. point > 0.503° TPS	 Throttle adaptation demanded Accelerator pedal value < 99.9% Engine speed < 64 RPM Vehicle speed < 2 km/h IAT @ throttle > 5° C ~~ Signal (tco) 5 – 120° C 			
P0642 Sen- sor Refer- ence Volt- age "A" Circuit Low	Engine Control Module (ECM): 5V Supply Voltage Out Of Range Low	Analog output 1 supply volt- age < 4.62 V sauthorised by Volkewage sauthorised by Volkewage	n AG. Volkswagen AG does i	Oct guarantee or at	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
P0643 Sen- sor Refer- ence Volt- age "A" Circuit High	Control Module (ECM): 5V Supply Voltage Out Of Range High	1 supply volt- age > 5.43 V		• Continuous	to the correctness of information in this occurrence.	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0652 Sen- sor Refer- ence Volt- age "B" Circuit Low	Control Module	Analog output 2 supply volt- age < 4.62 V	_{isad} by Volkswagen AG. Volk	 0.2 s Continuous swagen AG doe	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
P0653 Sen- sor Refer- ence Volt- age "B" Circuit High	Supply Volt-	• Analog output 2 supply voltage > 5.43 V		• 0.2 s • Continuous	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - 3623 - Refer to appropriate repair manual.
P0657 Actua- tor Sup- ply Volt- age "A" Cir- cuit/ Open	Engine Compo- nents Sup- ply Voltage Relay Open Circuit	Output voltage lower range >= 1.90 - 2.30 V	• Actuator commanded off	• 1.0 s • Continuous	• 2 DCY	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145.
P0658 Actua- tor Sup- ply Volt- age "A" Circuit Low	Engine Compo- nents Sup- ply Voltage Relay Short To Ground	Output volt- age (hard- ware values) < 1.90 – 2.30 V	Actuator com- manded off	1.0 sContinuous	• 2 DCY	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271 , Checking", page 1145 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P0659 Actuator Supply Voltage "A" Circuit High	Engine Compo- nents Sup- ply Voltage Relay Short To Battery Plus	 Output current > 1.0 - 2.3 A Actuator temperature > 175 - 195° C 	Actuator com- manded on	• 1.0 s • Continuous	• 2 DCY	- Check the Motronic Engine Control Module Power Supply Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145 .
P0686 ECM/ PCM Power Relay	Main Relay Rationality Check Dur- ing Engine Off	Sensed circuit voltage > 6.0 V	 Actuator commanded off For time >= 0.3 s 	• 0.1 s • Continuous	• 2 DCY	 Check the Motronic En- gine Control Module Pow- er Supply
Con- trol Circuit Low	Main Relay Short To Ground	Output volt- age 51.85 – 2:28 V	NollActuator commanded off especial commanded of especial comman	Tanice of acceptal	A liability Mil	Relay - J271 Refer to ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145.
ECM/ PCM Power Relay	Rationality Check Dur- ing Engine Running	Sensed circuit voltage < 5.0 V	 Actuator commanded on For time >= 0.1 s 	• 0.1 s • Continuous	• 2 DCY	Check the Motronic Engine Control Module Power Supply
Circuit High and leiphon	Ware of comme	 Main relay driver temperature > 175 – 195° C Or Main relay output current > 1.0 – 2.3 A 	 Actuator commanded on For time >= 0.4 s 	• 0.2 s • Continuous	rectness of information in this o	Relay - J271 Refer to ⇒ "3.6.23 Motronic En- gine Control Module Pow- er Supply Relay J271, Checking", page 1145.
P0698 Sen- sor Refer- ence Volt- age "C" Circuit Low	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range Low	• Analog output 3 supply volt- age < 4.62 V	y Volkswagen A.G.	O.2 s in Continuous Autous	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	P0699 Sen- sor Refer- ence Volt- age "C" Circuit High	Engine Control Module (ECM): 5V Supply Volt- age Out Of Range High	Analog output 3 supply volt- age > 5.43 V		• 0.2 s • Continuous	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
oommercial purposes, in part or in whole, is not been in whole, is not been in the commercial purposes.	P13E A Cold Start Ignition Timing Performanc e Off Idle	Cold Start Monitoring Ignition Control (IC) Ignition Timing Monitor	Ratio between ignition angle efficiency integral and time at part load > 0.12 [-] gen AG. Volkswagen AC	 Engine part load For time >= 0.0 s Ignition angle efficiency set point <= 0.88 [-] Vehicle speed > 2 km/h Barometric pressure > 73.0 kPa Catalyst heating active Engine start temperature 5 – 45° C Time after engine start > 2.0 s Diff. air mass set point vs. filtered air mass set point vs. filtered air mass set point for load dynamic detection < 99,999.0 mg/stk For time >= 0.0 s Diff. engine speed for engine speed dynamic detection < 8,160 RPM For time >= 0.0 s 	he correctness of information in \mathcal{U}_{S}	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 - Refer to appropriate repair manual.
	P1545 Thrototle Actuator "A" Control Motor Circuit Rang e/Per-	Throttle Actuator Out Of Range	• Control duty cycle > 98.0%	Throttle position not at min value Throttle adaptation not active Actuator commanded on	0.7 s Continuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Check-

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
for- manc e	Throttle Actuator Rationality Check	Difference be- tween throttle position set point and throttle flap opening angle for electronic throttle control > 2.998 – 24.982° TPS	tion (@ initial start or after detection of throttle exchange or checksum error) not active • Actuator commanded on • Diff. throttle position set point vs. throttle flap opening angle <= 1.999; > -1.999° TPS	0.5 s Continuous		ing", page 1169 .
Crash	Crash De- tection Air- bag Safety Measures Due To Crash With Airbag Acti- vation	Airbag(s) activated Airb	ised by Volkswagen AG. Volk	• 0.0 s • Contin- swa (yous) do	• 2 DCY	- After proper repair of damage, erase the Engine Control Module - J623- DTC. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21.
ing Mode	Engine Control Module (ECM): Transport	• unbout of commercial purposes, in part or in part or or or in part or	 Vehicle speed < 5 km/h Max trip mileage since initial vehicle start-up < 	Continuous	• 1 DCY	- Vehicle is in Transport Mode (Loading Mode). It can be turned off with a scan tool or will automatically switch off after approximately 100 km (62.15 miles) have accumulated on the vehicle. May need to perform readiness check. Refer to ⇒ "3.2 Readiness Code", page 14.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Mani- fold Run- ner Con- trol	Intake Manifold Runner Control (IMRC) Ac- tuator Func- tional Check: Stuck Open	 Signal voltage > 1.89 V For time >= 1.5 s 	 Actuator commanded off Time after engine start > 5.0 s 	• 0.2 s • Continuous	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137.
		s sauthorised	oy Volkswagen AG. Volkswa	gen AG does no	*9uaranteeorace	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.
Mani- fold Run- ner Con- trol	Manifold Runner Control (IMRC) Ac- tuator Func- tional	• Signal voltage <3.10 V • For time >= 1.5 s	 Actuator commanded on Time after engine start > 5.0 s 	• 0.2 s • Continuous	• 2 DCY Sy	- Check the Intake Manifold Runner Position Sensor - G336- Refer to ⇒ 3.6.19 Intake Manifold Runner Position Sensor G336 Checking" page 1137
		A Sold of the sold	Protected by co.	Olkewagen AG.	NAGHURIHAOO Hauri	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time	MIL dlumina tion	Component Diagnostic Procedure
P2008 Intake Manifold Runner Control Circuit/ Open Bank	Manifold	 Output voltage lower range >= 1.92 - 2.21 V Output voltage upper range (hardware values) <= 2.85 - 3.25 V 	Engine running Actuator commanded off Engine running Actuator commanded off Actuator commanded off	• 2.0 s • Continuous	• 2 DCY	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135 Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor - G336, on Checking", page 1137.
P2009 Intake Mani- fold Run- ner Con- trol Circuit Low Bank 1	Intake Manifold Runner Control (IMRC) Ac- tuator Short To Ground	Output volt- age (hard- ware values) < 1.92 – 2.21 V	Engine running Actuator commanded off	• 2.0 s • Continuous	• 2 DCY	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135 Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor - G336, Checking", page 1137.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2010 Intake Mani- fold Run- ner Con- trol Circuit High Bank 1	Manifold Runner Control (IMRC) Ac- tuator Short To Battery Plus	Power stage temperature > 160 - 200° C Output current > 4.0 - 7.0 A Porisectory Volkswagen AC	 Engine running Actuator commanded on 	• 2.0 s • Continuous .	• 2 DCY	- Check the Intake Manifold Runner Control Valve - N316 Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135 Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137.
Manifold Run-Yamul Senjul Senj	Intake Manifold Runner Control (IMRC) Po- sition Sen- sor Short To Ground / Open Cir- cuit	• Intake manifold runner flap position sensor voltage < 0.20 V	Engine start not active	0.04 sContinuous	OCY DCY Altanithrespect to the correctness of information in this oco.	- Check the Intake Manifold Runner Position Sensor - G336 Refer to

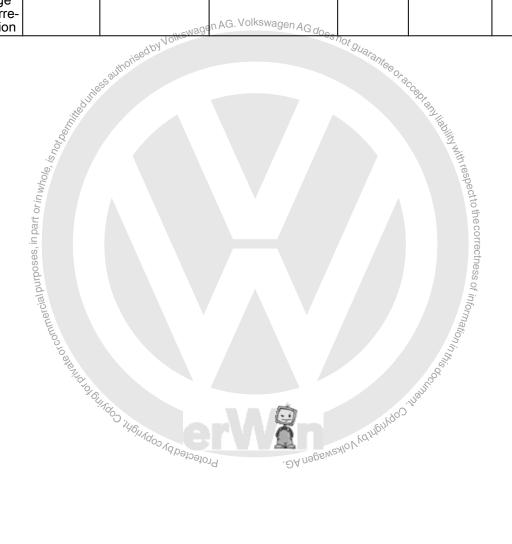
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2017 Intake Mani- fold Run- ner Posi- tion Sen- sor/ Switc h Cir- cuit High Bank	Intake Manifold Runner Control (IMRC) Po- sition Sen- sor Short To Battery Plus	Intake manifold runner flap position sensor voltage > 4.80 V	Engine start not active	0.04 s Continuous	• 2 DCY	- Check the Intake Manifold Runner Position Sensor - G336 Refer to ⇒ "3.6.19 Intake Manifold Runner Position Sensor G336, Checking", page 1137.
		orin whole, is holy bere	Actuator com-	gen Ad. Volkov	agen AG does not	- Check the Intake Manifold Runner Control Valve N316- Refer to ⇒ "3.6.18 Intake Manifold Runner Control Valve N316, Checking", page 1135.
P2088 "A" Cam- shaft Posi- tion Actua- tor Con- trol Circuit Low Bank	Variable Valve Tim- ing (VVT) Intake Ac- tuator Short To Ground	age < 1.92 – 2.21 V	manded off	Continuous	• 2 DCY	Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40 Checking". page 1107.
1			State of Bridges in the indoor years of	io1 ^q	JA Nagen AG.	- Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205. Checking", page 1105.

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value		Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
mmercial purposes, in part or in whole, is,	"A" Cam- shaft Posi-	Valve Tim- ing (VVT) Intake Ac- tuator Short To Battery	Power stage temperature > 160 - 200° C Output current > 8.0 - 12.0 A	Actuator commanded on the contract of the	iability with respect to the correctness of information in this coo	• 2 DCY	 Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107 . Check the Camshaft Adjustment Valve 1 - N205 Refer to ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205 , Checking", page 1105 .
		Fuel System Out Of Range Low	• Adaptation value < -0.05 [-]	 2nd lambda control not active Catalyst purge not active Injection mode change (DFI/MFI) not active Engine speed >= 704 RPM Counter of integrated mass for fuel in oil not calibrated [-] Choice of: O2S rear (binary) check not active O2S rear (binary) check finished 	• Continuous	• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2097 Post Cata- lyst Fuel Trim Sys- tem Too Rich Bank 1	Fuel Sys- tem Out Of Range High	Adaptation value > 0.05 [-] Indicate of the second o	 2nd lambda control not active Catalyst purge not active Injection mode change (DFI/MFI) not active Engine speed >= 704 RPM Counter of integrated mass for fuel in oil not calibrated [-] Choice of: O2S rear (binary) check not active O2S rear (binary) check finished 	• 81.0 s • Continuous	• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Oxygen Sensor 1 After Catalytic Converter GX7 - Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149
	Throttle Acount tuator Open Circuit		 Difference between measured and filtered throttle position <= 119.50° TPS Actuator commanded off 	O.1 s Continuous	2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 2 DCY 3 DCY 4 D	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169
P2101 Throt- tle Ac- tuator "A" Con- trol Motor Circuit Rang e/Per- for- manc e	Throttle Actuator Over Temperature	• Electronic throttle valve driver temperature (hardware values) > 170.0 – 190.0° C	Actuator commanded on	• 0.1 s • Continuous	• 2 DCY of information in this occurs.	0

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Throttle Actuator Short Circuit	Electronic throttle valve driver current > 9.3 – 15.0 A	Actuator com- manded on	0.1 sContinuous	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.34 Throttle Valve Control Module GX3, Checking", page 1169.
Throt- tle/	SENT: Accelerator Pedal Position (APP) Sensor 1 Circuit Low	• Sensor value < 0.39 V	n AG. Volkswagen AG does i	• 0.3 s • Continuous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .
Throt- tle/		• Sensor value > 4.86 V		0.3 sContinuous	Cytith respect to the correctness of	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .
Throt- tle/	Pedal Position (APP) Sensor 2	• Sensor value < 0.19 V	THE SERVEN	O.3 s Continuous O.3 s O.3 s	• 2 DC Tration in this of the part of the	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .
Throt- tle/	SENT: Ac- celerator Pedal Posi- tion (APP) Sensor 2 Circuit High	• Sensor value > 2.80 V	d .€) ₩ do.	0.3 sContinuous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Throt- tle/	SENT: Accelerator Pedal Position (APP) Sensor 1 and 2 Rationality Check	Difference between signal voltage sensor 1 and sensor 2 > 0.10 – 0.12 V	n AG. Volkswage <i>n AG d</i> oos	• 0.4 s • Continuous	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 , Checking", page 1101 .



DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Sys- tem Too	Fuel Sys- tem Direct Fuel Injec- tion System	Adaptive val- ue >= 28.0%	 Air mass > 60.0 mg/stk For 1.8L: ~~ Signal (tco) > 55° C 	• 5.0 s • Continuous	• 2 DCY	Check vac- uum lines visually for leaks.
Lean Off Idle Bank 1	Too Lean @ Part Load		 For 2.0L: ~~ Signal (tco) > 60° C IAT @ manifold > -48° C 			Check the intake system visually for leaks (false air).
			 AAT > -48° C Lambda set point 0.92 – 1.05 [-] 			- Check the fuel pressure and delivery quantity. Re-
			 Lambda control closed loop Integrated air 			fer to fuel system me- chanical test- ing in
			·			⇒ "3.1 Pre-
	,,o ⁱ	sedby Volkswagen AG. V	Since ingress Since ingress Engine speed 1,280 – 4,000 suggested RPM	anto-		or to appropriate repair manual.
	cilled unless auth.		Low dynamic conditions:Diff. engine	or acceptant		- Check the Fuel Injec- tors . Refer to ⇒ "3.6.14 Fuel Injec-
Whole, is no.	Wed The state of t	_{sed} by Volkswagen AG. V	 Fuel mass 17.99 51.02 mg/stk Engine speed 1,280 – 4,000 Quark Low dynamic conditions: Diff. engine speed vs. averaged engine speed for engine speed dynamic detection < 100 – 175 RPM Diff. air mass vs. averaged air 		with respect	tors, Checking", page 1127. - Check the
commercial purposes, in part or ir			Diff. air mass vs. averaged air mass for load dy- namic detection < 30.01 – 60.0 mg/ stk		to the correctness of $information$ $information$ $information$	Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to *3.6.26 Oxygen Sen-
Commercia	Logentals.		 Diff. between reference and actual fuel pressure, high side <= 34,777.60 kPa Integrated air 		iformation in this	sor 1 Before Catalytic Converter GX10, Checking", page 1152.
	30 11/100 into	Protected by Copyrig	mass > 5.0 g Evap purge valve closed Canister load <= 1.20 [-]	Phygo ingr		- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Mod- ule - J538
			 Evap purge flow at max. value Dependence on canister purge min: 			Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538,

		1				
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh	Secondary Parame- ters with Enable Conditions	Monitoring Time CyLength	MIL Illumina- tion	Component Diagnostic Procedure
P2178 Sys- tem Too Rich	Fuel System Direction System Too Rich @ Part Load Part	Adaptive value <= -25.0%	 Air mass > 60.0 mg/stk For 1.8L: E~~ Signal (tco) > 55° 	• 5.0 s ^o /s.	• 2 DCY orange into the correctness of information in this continue to the correctness of the correctn	GX10, Checking", page 1152. Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538- Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125. Check the Intake Manifold Sensor - GX9- Refer to ⇒ "3.6.20 Intake Mani-
						fold Sensor

DTC / De- scrip- tion	Monitor Strategy Description		Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	are or commercial purposes, in part or in whole, is n		 Dependence on canister purge min: Lower limit of lambda controller output not calibrated Upper limit of lambda controller output not calibrated Evap purge flow at min. value 		in the contract of the contrac	GX9, Checking", page 1139. Check the Fuel Pressure Regulating Valve - N276 Refer to **3.6.15* Fuel Pressure Regulator Valve N276, Checking", page 1129.
		COLONGINADO NADE	Protecte	обемь Мория (Премя в В	in this of the state of the sta	

DTC / Monitor Strates	teria and Thresh	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2181 Cooling System Perform ance No The Exp ted Range e	c- after a suffi-	 (upper threshold) <= 47 - 57° C AAT > -10° C Start of fault decision: Modeled ECT > 66 - 76° C Conditions at fault decision: Accum. fuel cut off time since first engine start <= 10.20% Accum. start-stop time since first angine start <= 10.20% 	DCY G. Volkswager		- Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.9 Engine Coolant Temperature Sensor G62. Checking". page 1117. Check the Engine Coolant Temperature Sensor On Radiator Outlet G83 Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83. Checking". page 1119 - Check the After-Run Coolant Pump - V51 Refer to ⇒ "3.6.2 After-Run Coolant Pump - V51 Refer to ⇒ "3.6.2 After-Run Coolant Pump V51. Checking". page 1103. - Check the engine coolant thermostat. Refer to appropriate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			• Relative MAF > 5.0%			
			 Vehicle speed >= 0 km/h 			
			Modeled ECT > 65° C			
			• Engine stop counter < 255.0 [-]			
			• For time >= 15.0 s			



DTC / Monitor Stratego Description	√ teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2183 En- gine Cool- ant Tem- pera- ture Sen- sor 2 Circuit Rang e/Per- for- manc e) D:# EOT @	 >= 360.0 min Engine off time plausible Time after engine start <= 6,553.5 s Depending on temperature slope @ cold start Diff. actual IAT @ manifold vs. IAT @ manifold vs. IAT @ manifold @ start of DCY < 256.0 K Diff. actual ECT downstream engine ws. ECT downstream engine @ start of DCY not calibrated K Diff. actual ECT @ radiator outlet ws. ECT @ radiator outlet vs. ECT @ radiator outlet ws. ECT @ radiator outlet @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Diff. actual AAT vs. AAT @ start of DCY < 256.0 K Depending on mean value condition Mean value of all temperature sensors @ cold start >= -256° C Number of valid sensors >= 2.0 [-] Depending on block heater / solar radiation detection Time after engine start >= 0.5 s Vehicle speed >= 			- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83- Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Min. amount of faulty refer- ence meas- urements to detect defec- tive sensor	Diff. actual ECT downstream en- gine vs. min. ECT downstream en- gine not calibra- ted K			
		2.0 [-]	Diff. actual AAT vs. min. AAT < 4.5 K			
			Diff. actual ECT @ radiator outlet vs. min. ECT @ radiator outlet < 4.5 K			
En- gine	Engine Coolant Tempera- ture (ECT) Sensor @ Radiator Outlet Short To Ground	• Sensor volt- age <= 0.30 V		• 0.5 s • Continuous	• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor On Radiator Outlet - G83 Refer
Sen- sor 2 Circuit Low	l	yyvolkswagen AG. Volks	swagen AG does not guarante	² Or ^a CC _B D _f a _D _f		⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119
Engine Cool- gine Cool- ant Tem- pera- ture Sen- sor 2	Engine Coolant Tempera- ture (ECT) Sensor @ Radiator Outlet Short To Battery / Open Cir- cuit	• Sensor volt- age > 4.90 V	IAT @ throttle >= -33° C Time after engine start > 60.0 s Paragraph Annual Control of the control of	0.5 soContin	2 DCY 2 m respect to the correctness of information	- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83- Refer to ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 1119
00 10 878111	THO TO SHOW	Protected by co	. ĐA nagewaylo V vơ mộn	ninthis oo Culture, Co.		- Check the Engine Cool- ant Temper- ature Sensor - G62 Refer to ⇒ "3.6.9 En- gine Coolant Temperature Sensor G62, Checking", page 1117.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Sys- I tem S	Direct Fuel njection System Too Lean @ Idle	Case 1:Adaptive value >= 2.40 mg/stk	 Air mass > 60.0 mg/stk For 1.8L: ~~ Signal (tco) > 55° C 	• 5.0 s • Continuous	• 2 DCY	 Check the vacuum lines visually for leaks.
at Idle Bank 1		Case 2:Adaptive value not calibrated kg/h	 For 2.0L: ~~ Signal (tco) > 60° C IAT @ manifold > -48° C 			 Check the intake system visually for leaks (false air).
			 AAT > -48° C Lambda set point 0.92 – 1.05 [-] 			 Check the fuel pressure and delivery quantity. Re-
			Lambda control closed loopIntegrated air			fer to fuel system me- chanical test- ing in
	cedby	_{OlksW} agen AG. Volkswa	mass >= 5.0 – 200.0 g Gen Vehicle speed < 6 km/h			⇒ "3.1 Pre- liminary Check", page 13 and or to appro-
	ess authoris		 Low dynamic conditions: Diff. engine speed vs. aver- 	CC PDF AND 1		priate repair manual. - Check the Fuel Pres-
Whole, is not bein			 Lambda set point 0.92 – 1.05 [-] Lambda control closed loop Integrated air mass >= 5.0 – 200.0 g Vehicle speed < 6 km/h Low dynamic conditions: Diff. engine speed vs. averaged engine speed for engine speed dynamic detection < 100 – 175 RPM Diff. air mass vs. averaged air mass for load dynamic detection < 30.01 – 60.0 mg/ et/k 	cceptand liability with respection		sure Sensor G247 Re- fer to ⇒ "3.6.16 Fuel Pres- sure Sensor
			Diff. air mass vs. averaged air mass for load dy- namic detection < 30.01 – 60.0 mg/ stk	One	sa correction	G247, Checking", page 1131. - Check the Fuel Injec-
ie or commercial Pa	ENTOD INGULACON		Diff. between ref- erence and ac- tual fuel pres- sure, high side <= 34,777.60 kPa	ooi Information in this coch that it		tors . Refer to ⇒ "3.6.14 Fuel Injec- tors , Check- ing", page 1127 .
CUITO TO	Eliscos :		 Integrated air mass > 5.0 g Fuel mass upper range < 0.0 – 17:0 	, in the state of		 Check the Oxygen Sen sor 1 Before Catalytic
	*4011V900V	Protected	mg/stk • Fuel mass lower range > 0.0 mg/ stk			Catalytic Converter - GX10 Re- fer to ⇒ "3.6.26 Oxygen Sen
			• Engine speed 704 – 992 RPM			sor 1 Before Catalytic Converter
			Engine not calibratedEvap purge valve closed			GX10 , Checking", page 1152 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
^{Vh} ole, is not _D olmit _e ,	anas saumoris ed th	Volkswagen A.G. Volksv	 Canister load <= 1.20 [-] Evap purge flow at max. value Depending on canister purge min: Lower limit of lambda controller output not calibrated Upper limit of lambda controller output not calibrated Evap purge flow at min. value 	tagad tan hapin minin mi		- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538, Testing", page 1125 . - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Manifold Sensor GX9- Checking", page 1139 . - Check the Fuel Pressure Regulating Valve - N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", Checking",
ommercial purposes, in part of	1018HAGOS ;146;1AGOS	Protected by	DA nageweallo V Vo meinga	The state of the s	othe correctness of into	page 1129 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Direct Fuel Injection System Too Rich @ Idle	 Case 1: Adaptive value <= -2.40 mg/stk Case 2: Adaptive value not calibrated kg/h 	 Air mass > 60.0 mg/stk For 1.8L: ~~ Signal (tco) > 55° C For 2.0L: ~~ Signal (tco) > 60° C IAT @ manifold > -48° C AAT > -48° C 	• 5.0 s • Continuous	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/
			 Lambda set point 0.92 – 1.05 [-] Lambda control closed loop Oil dilution not calibrated 			or to appropriate repair manual. - Check the Fuel Injectors . Refer to ⇒ "3.6.14
			 Integrated air mass >= 5.0 – 200.0 g Vehicle speed < 6 			⇒ 3.0.14 Fuel Injectors, Checking", page 1127. - Check the
			 km/h Low dynamic conditions: Diff. engine speed vs. averaged engine 			Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to "3.6.26
	Ne55 au	orised by Volkswagen AG	speed for engine speed dynamic defection < 100 – 175 RPM Diff. air mass vs. averaged air mass for load dy-	arantee or accep		Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152.
r in who!	A Sociology of the Colonial Co		 Verificie speed < 0 km/h Low dynamic conditions: Diff. engine speed vs. averaged engine speed for engine speed dynamic detection < 100 - 175 RPM Diff. air mass vs. averaged air mass for load dynamic detection < 30.01 - 60.0 mg/stk Diff. between reference and actual fuel pressure, high side <= 34,777.60 kPa Integrated air mass > 5.0 g Fuel mass lower range > 0.0 mg/stk Fuel mass upper range < 0.0 - 17.0 mg/stk Engine speed 704 - 992 RPM Engine not calibrated 	arantee or acceptal.	Maplin with respect to	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13
cial purposes, in part c			 Integrated air mass > 5.0 g Fuel mass lower range > 0.0 mg/ stk 		the correctness of info	Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
	Sund physical of comme		 Fuel mass upper range < 0.0 – 17.0 mg/stk Engine speed 704 – 992 RPM Engine not cali- 	(Inglite	rmation in this of	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.20 Intake Mani-
	**************************************	Protected by copyright	y Volkewagen AG.	a Manydo's	3. Diag	fold Sensor nosis and Testing

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		or commercial purposes, in part or in whole, is not bey	 Evap purge valve closed closed seed seed seed seed seed seed seed	o _{ld}		GX9, Checking", page 1139. - Check the Fuel Pressure Regulating Valve-N276 Refer to ⇒ "3.6.15 Fuel Pressure Regulator Valve N276, Checking", page 1129. - Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123.

P2195 Oxygen O2 Sensors Sen- Sen- Sen- Sen- Sen- Signal Biase d/ Stuck Lean Bank 1 Sen- sor 1 P2195 Oxygen O2 Sensors Rationality Signal Check Biase d/ Stuck Lean Bank 1 Sen- sor 1 P2195 Oxygen O2S front ready O2S rear: Lambda value > 1.15 [-] O2S signal rear >= 0.88 V Palusibility signal check O2S front ready O2S rear ready C2S front ready O2S rear ready C2S front ready C2S front ready C2S rear ready C2S rear ready C2S front ready C2S rear ready C2S front ready C2S rear ready C2S rear ready C2S front ready C2S rear ready C2S rear ready C2S front ready C2S rear ready Call rear series C2N10 Catalytic Converter GX10 - Reck rear series C2X10 - Reck re
• Second control loop active: • Air mass 0.05 – 0.75 g/stk • Engine speed 576 – 4,512 RPM

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Open loop check: Lambda set value 1.0 [-] O2S signal front < 1.06 [-] 	 Fuel cut off not active Engine running Choice of: Fuel trim diagnosis failure detected O2S rear sensor plausibility failure detected Choice of: Lambda adaptation value >= 0.12 [-] Lambda adaptation value <= -0.12 [-] 	• 0.0 s • Continuous		



DTC / Monito De- scrip- tion Strateg Descripti	Malfunction Cri- teria and Thresh- n old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure
P2196 Oxygen Sensors (O2S) From Signal Biase d/ Stuck Rich Bank 1 Sensor 1	000	300.0 kg/h Catalyst purge			- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to → "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 - Check the Fuel Delivery Unit - GX1-/Fuel Pump Control Module - J538 Refer to → "3.6.13 Fuel Delivery Unit GX1 Fuel Pump Control Module - J538 Refer to → "3.6.20 Intake Manifold Sensor - GX9 Refer to → "3.6.20 Intake Manifold Sensor GX9 Refer to → "3.6.20 Intake Manifold S

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
commercial purposes, in part or in whole, is now	Fuel Svs-	 Open loop check: Lambda set value 1.0 [-] O2S signal front > 0.89 [-] 	 Fuel cut off not active Engine running Choice of: Fuel trim diagnosis failure detected O2S rear sensor plausibility failure detected Choice of: Lambda adaptation value >= 0.12 [-] Lambda adaptation value <= -0.12 [-] 	• 0.0 s • Continuous	Y CY and the correctness of information in the correctness of information	
C Cylin- der 1	Fuel System Predicted Adaptation Out Of Range Low	Adaptation value un-weighted < -13.0%	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] Catalyst heating not active Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure >= 0.0 kPa Mass fuel flow set point 12.0 – 29.99 mg/stk Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start > 0.0 [-] Time after engine 	• Once / DCY	• 2 DCY	 Check the spark plugs visually for signs of fouling. Check the intake system visually for leaks (false air). Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 13 and/or to appropriate repair manual. Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127 Check the Ignition Coils with Power Output

		CES OF			O Q	200			
	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Se	econdary Parame- ters with Enable Conditions	Monitoring Time Length		. Illumina- tion	Component Diagnostic Procedure
Whole	18,18	Fuel Sys- tem Adap- tation Moni-	Cylinder 1:Adaptation value weigh-	•	Integrated mass air flow >= 0.75 – 7.0 kg	ith respect to			to ⇒ "3.6.17 Ig- <u>nition Coils</u> <u>With Power</u>
oart orij		of Range Low	ted < -10.0%	•	Rough road not detected	to me of	1000		<u>Output</u> <u>Stage ,</u>
rposes, in p					For 1.8L: Engine speed 1,248 – 2,816 RPM	on con	orrootpoo		Checking", page 1133
arcial pu	שונוס			•	For 2.0L: Engine speed 1,440 – 3,008 RPM	ot informat			
	phyaleorcof			•	Dependence on oxygen sensor diagnosis	ss of information in this document			
	. 40 <i>3</i>	Fuel System Adaptation Monitoring Out Of Range Low	lerW		calibrated	_T uguin.			
		3/1	Protected	.B.	Oxygen sensor delay diagnosis finished not cali- brated				
				•	Diagnosis at gear				
					1st gear not active				
				•	2nd gear not active				
				•	3rd gear not active				
				•	4th gear active				
					5th gear active				
					6th gear active				
					7th gear active				
				•	8th gear not active				
				•	Limited dynamic conditions				
				•	Dynamic engine speed < 75 RPM				
				•	Dynamic MAF < 29.99 mg/stk				
				•	Dynamic torque request < 0.10 [-]				
				•	Dynamic window lambda control < 5.0%				
				•	Dynamic ignition angle < 0.10 [-]				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Additional conditions 			
			Misfire on cur- rently lean shifted cylinder not de- tected			
D Cylin-	Fuel Sys- tem Predic- ted Adapta-	Cylinder 2:adaptation value un-	Modeled catalyst temperature <= 900° C	4 timesOnce / DCY	• 2 DCY	Check the spark plugs visually for
der 2 Air- Fuel	tion Out Of Range Low	weighted < -13.0%	• Lambda set value 0.97 – 1.03 [-]	D01		signs of foul- ing.
Ratio Imbal- ance			 Catalyst heating not active 			Check the in- take system visually for
unoc			 Fuel cut off not active 			leaks (false air).
			• ECT 60 – 143° C			Check the
			• AAT >= -48° C			fuel pressure and delivery
			 Barometric pres- sure >= 0.0 kPa 			quantity. Re- fer to fuel system me-
			 Mass fuel flow set point 12.0 – 29.99 mg/stk 			chanical test- ing in ⇒ "3.1 Pre-
			 Segment adaptation completed 			liminary Check", page 13 and/
		regpy Volker	Lambda control closed loop	loes not guara		or to appro- priate repair
		Bunkasauthorised by Volkes	 Segment adaptation completed AG. Volkswagen AG. Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] 	ante	30r-acco	manual. - Check the
	nii.	d in	 Canister load <= 2.0 [-] 		OF ADLIE	Fuel Injec- tors . Refer to ⇒ "3.6.14
	10tpo/		No gear shift		OIII MA	Fuel Injec- tors, Check-
	vhole, is,		• For segments 90.0 [-]		Middlithwith respect	ing", page 1127.
	urt or in w		Segments after start > 0.0 [-]			
	es, in pa		Time after engine start > 0.0 s			Check the Ignition Coils with Power Output Stage . Refer to
	or commercial purposes, in part or in whole, is not be and the second of		• Integrated mass air flow >= 0.75 – 7.0 kg		Ollin	to ⇒ "3.6.17 Ig- nition Coils With Power
	commer		 Rough road not detected 		rmation	Output Stage ,
	toelevil	Z _Q	 For 1.8L: Engine speed 1,248 – 2,816 RPM 		"""omation in this och the life is the lif	Checking", page 1133
		Roj Blindo i 46 Indo Napoj	 For 2.0L: Engine speed 1,440 - 3,008 RPM 	a Mazufin	100 Mg	
ı	1	~	Jen AG. Protec	, IOIKSWAG	ı	ı l

DTC /	Monitor	Malfunction Cri-	Secondary Parama	Monitoring	MIL Illumina-	Component Di
De- scrip- tion	Strategy Description	teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time Length	tion	Component Di- agnostic Proce- dure
	Fuel Sys- tem Adap- tation Moni-	Cylinder 2: Adaptation	Dependence on oxygen sensor di- agnosis			
	toring Out Of Range Low	value weigh- ted < -10.0%	Oxygen sensor dynamic diagno- sis finished not calibrated			
			Oxygen sensor delay diagnosis finished not cali- brated			
			Diagnosis at gear			
			1st gear not ac- tive			
			2nd gear not active			
			3rd gear not active			
			4th gear active			
			5th gear active			
			6th gear active			
			7th gear active			
			8th gear not active			
		9po.	 Limited dynamic AG conditions AG closs Dynamic engine speed < 75 RPM Dynamic MAF < 29 99 mg/stk 			
		norised by Volkswas	Dynamic engine speed < 75 RPM	ot guarante		
	Mille	5 auti	Dynamic MAF < 29.99 mg/stk	a or ac	Pop.	
	f Dormite		• Dynamic torque request < 0.10 [-]		Mighility	
	whole, is no		Dynamic window lambda control < 5.0%		withrespec	
	art or in		• Dynamic ignition angle < 0.10 [-]		A to the c	
	ses, in p		Additional conditions		orrectne	
	nmercial purpo	Sauthonised by Volkswage	Misfire on cur- rently lean shifted cylinder not de- tected		a. Diago	
	TO TO THE OF CO.				ON IN THIS OF CHANGE	
	* 041	14611600 Na	A .DAnegeway	10 Vedrighton J	\$ ⁶	
		, velous	1065W2,	Ī	İ	nosis and Testing

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P219 E Cylinder 3 Air- Fuel Ratio Imbalance	Fuel System Predicted Adaptation Out Of Range Low	• Cylinder 3: • adaptation value un-weighted < -13.0%	 ters with Enable Conditions Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] Catalyst heating not active Fuel cut off not active ECT 60 – 143° C 	Time Length • 4 times • Once / DCY	• 2 DCY	- Check the spark plugs visually for signs of fouling Check the intake system visually for leaks (false air).
	Mind or commercial purposes, Impart	authorised by Volkswagen	 Barometric pressure >= 0.0 kPa Mass fuel flow set point 12.0 – 29.99 mg/stk Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start > 0.0 [-] Time after engine start > 0.0 s Integrated mass air flow >= 0.75 – 7.0 kg Rough road not detected For 1.8L: Engine speed 1,248 – 2,816 RPM For 2.0L: Engine speed 1,440 – 3,008 RPM Dependence on oxygen sensor diagnosis Oxygen sensor diagnosis finished not calibrated 	NAMING THE STATE OF THE STATE O	ne correctness of information in this cool, in	 Check the Fuel Injectors. Refer to ⇒ "3.6.14 Fuel Injectors, Checking", page 1127. Check the Ignition Coils with Power Output Stage. Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage., Checking", page 1133.

	2500			of a	2		
2t/00/mit	DTC / De- scrip- tion	Monitor Strategy Description Fuel System Adaptation Monitoring Out Of Range Low	Malfunction Cri- teria and Thresh- old Value	Secondary Para ters with Enal Conditions	Monitoring ble Time Length	MIL Illumina- tion	Component Di- agnostic Proce- dure
whole, is n		Fuel Sys- tem Adap- tation Moni-	Cylinder 3:Adaptation value weigh-	Oxygen sensitive delay diagnormal finished not brated	osis 📗 🝖		
rt orir		Of Range	ted < -10.0%	Diagnosis at	tothe		
es, in par		Low		1st gear not tive	ac-		
al purpos				2nd gear not tive	: ac-		
mmercia				3rd gear not tive	ac-		
55,000				4th gear acti	ve 🤼		
16714				5th gear acti	ve 🎺		
	Of CUIS		-*	5th gear acti6th gear acti	ve ^{ill}		
	1000	46.		7th gear acti	ve		
		iected by copyrion	DA NE.	• 8th gear not ce∾tive	ac-		
				Limited dyna conditions	ımic		
				• Dynamic end speed < 75 i	RPM		
				 Dynamic MA 29.99 mg/stł Dynamic tord 	C		
				Dynamic tore request < 0.1Dynamic wir	10 [-]		
				lambda cont 5.0%	rol <		
				Dynamic ign angle < 0.10	[-]		
				Additional co tions	ondi-		
				Misfire on curently lean slocylinder not a tected	nifted		
							(

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P219 F Cylin- der 4 Air-	Fuel Sys- tem Predic- ted Adapta- tion Out Of Range Low	Cylinder 4:adaptation value un-weighted 	 Modeled catalyst temperature <= 900° C Lambda set value 	4 times Once / DCY	• 2 DCY	Check the spark plugs visually for signs of fouling.
Fuel Ratio Imbal- ance	_	-13.0%	 0.97 – 1.03 [-] Catalyst heating not active Fuel cut off not active 			Check the intake system visually for leaks (false air).
			 ECT 60 – 143° C AAT >= -48° C Barometric pressure >= 0.0 kPa 			- Check the fuel pressure and delivery quantity. Refer to fuel
		morised by Volkswagen A	Mass fuel flow set point 12.0 – 29.99 mg/stk	gu _{afantee}	tand liability with respect to the correctness of Info	system me- chanical test- ing in ⇒ "3.1 Pre- liminary
	in the second se	Su.	 Segment adaptation completed Lambda control closed loop 	or accep	RAN Jiabi	Check', page 13 and/ or to appro- priate repair manual.
	n whole, isnot _o		 Catalyst purge not active Canister load <= 2.0 [-] 		it) with respect	- Check the Fuel Injectors . Refer to ⇒ "3.6.14
± 0.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2			No gear shiftFor segments 90.0 [-]		the correctne	Fuel Injectors, Checking",
	nmercial purpo		 Segments after start > 0.0 [-] Time after engine start > 0.0 s 		ess of informati	Check the Ignition Coils with Power Output Stage . Refer
	TOO PORTURAGE OF COL		 Integrated mass air flow >= 0.75 – 7.0 kg 		on in this occur	to ⇒ "3.6.17 Ig- nition Coils With Power
	u _{lstat}	Protected by Copyright	 Segments after start > 0.0 [-] Time after engine start > 0.0 s Integrated mass air flow >= 0.75 - 7.0 kg Rough road not detected For 1.8L: Engine speed 1,248 - 2,816 RPM For 2.0L: Engine speed 1,440 - 3,008 RPM 	Warighton fre		Output Stage , Checking", page 1133 .
			 Dependence on oxygen sensor di- agnosis Oxygen sensor 			
			dynamic diagno- sis finished not calibrated			

		Jolkswagen Act. Velkow	does not				
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
setpurposeo, III pari Orin Wiole, isnotoeomia	Fuel Sys- tem Adap- tation Moni- toring Out	Cylinder 4:Adaptation value weighted < -10.0%	 Oxygen sensor delay diagnosis finished not cali- brated 	Sent liability with respe			
hole,	Of Range Low	led < -10.0 %	 Diagnosis at gear 	resp			
c or in w			1st gear not active		2		
, c)			 2nd gear not active 		the correctnes		
South			3rd gear not active		S D		
rcial			4th gear active	"HOr			
mme			• 5th gear active	matic			
901CO			6th gear active	ninth			
Things of commercials			7th gear active	6000			
	OLILA CIO	NA	8th gear not active	THO THE SOUTH THE SOUTH STREET			
	S. GUIAGO TUGUNAGO	(q _{Daya}	Limited dynamic conditions				
		Protogio19	• "Dynamic engine speed < 75 RPM				
			 Dynamic MAF < 29.99 mg/stk 				
			 Dynamic torque request < 0.10 [-] 				
			 Dynamic window lambda control < 5.0% 				
			 Dynamic ignition angle < 0.10 [-] 				
			 Additional conditions 				
			 Misfire on cur- rently lean shifted cylinder not de- tected 				
					2.5	nosis and Testing	12

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2237 O2 Sensor Positive Current Control Circuit/ Open Bank 1 Sensor 1	Oxygen Sensors (O2S) Front Open Cir- cuit Pump Voltage (VIP)	 Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 1.20 V Diff. nernst voltage (VG) <= 1.20 V Choice of: Nernst voltage (VN) > 4.40 V Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground voltage (VG) < -2.35 V Diff. pernst voltage (VG) < -2.35 V Diff. nernst voltage (VG) > 1.60 V Diff. nernst voltage (VG) > 1.60 V Pump current > 11.5 mA Measurement O2S front label resistor not calibrated Ω 	Secondary Parameters with Enable Conditions O2S front (linear) ready O2S ceramic temperature > 785° C For time >= 10.0 s	• 2.3 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10. Checking". page 1152.

Sen- sor 1 Open Cir- Refer- ence Volt- age Cir- Sor 1 Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) > 1.20 V Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) > 2.35 C Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. prems voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V Diff. nernst voltage (VIP) vs. virtual ground volt- age (VG) > 2.35 V		DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
-0.10 V • Pump current > 11.5 mA • Measurement O2S front label resistor	mercial purposes, in part or in whole, is	P2243 O2 Sen- sor Refer- ence Volt- age Cir- cuit- cuit- Open Bank	Oxygen Sensors (O2S) Front Open Cir- cuit Nernst Voltage	Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 1.20 V Diff. nernst voltage (VG) <= 1.20 V Choice of: Nernst voltage (VN) > 4.40 V Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 2.35 V Diff. pump voltage (VIP) vs. virtual ground voltage (VG) > 2.35 V Diff. nernst voltage (VG) < -2.35 V Diff. nernst voltage (VG) > 1.60 V	• O2S front (linear) ready • O2S ceramic temperature > 785° C 9427 P. O2S	• 2.3 s • Continuous • Continuous	• 2 DCY	dure - Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10,

DTC / Mon De- Strat scrip- Descri tion	egy	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
P2251 Oxyge O2 Sensor Negative Current Control Circuit/ Open Bank 1 Sensor 1	s Front Cir- tual	Diff. pump voltage (VIP) vs. virtual ground volt-	O2S front (linear) ready O2S ceramic temperature > 785° C For time >= 10.0 s Republication of the control of the	• 2.3 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10-, Checking", page 1152.	of tan liability with respect to the correctness of information in this coculing

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		Diff. nernst voltage (VN) vs. virtual ground volt- age (VG) > 1.20 V				
P2257 AIR Sys- tem Con- trol "A" Circuit Low	Secondary Air Injection (AIR) Pump Relay Short To Ground	• Output volt- age < 1.92 – 2.21 V	Engine running Actuator commanded off	• 0.5 s • Continuous	• 2 DCY	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157 .
AIR Sys- tem Con- trol "A" Circuit High	Plus	160 – 200° C Output current > 1.0 – 2.0 A		uous _{Felo}	at any liability with respect to the correctne	- Check the Secondary Air Injection Pump Relay - J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157 .
	einammoroase or commercial	orolected by Copylightic Cop	A SANSGEN P.G.	ON MAINENAGO TH	SS Of Information in this occurs	

DTC / Monitor De- scrip- tion Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Conditions	Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2261 Tur- bo- charg- er/Su- per- charg- er By- pass Valve "A" - Me- chani- cal Turbo- charger (TC) By- pass Actua- tor Func- tional Check: Stuck Close	 Case 1: Integrated boost pressure deviation between pressure upstream throttle and filtered pressure upstream throttle crosses filtered pressure upstream throttle sequence for incrementing counter in case 2: For 1.8L: Positive difference between pressure upstream throttle and filtered pressure upstream throttle Negative difference between pressure upstream throttle Negative difference between pressure upstream throttle Negative difference between pressure upstream throttle (First count: only positive difference) < -2.0 kPa 	 BARO > 73.0 kPa Intake overpressure protection not active Active turbocharger protection leading to opening of the waste gate not active Activations conditions: Recirculation actuator position set point 100.0% Time since actuator commanded open <= 1,200.0 ms Gradient accelerator pedal value <= -97.70%/s Max boost pressure variation <= 50.0 kPa 			- Check the Turbocharger Recirculation Valve - N249 - Refer to ⇒ "3.6:35 Turbocharger Recirculation Valve N249 Checking", page 1172 . - Check the Actuator - V465 - Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465 , Checking", page 1113 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Tur- bo- charg- er/Su- per- charg- er	tion Sensor First Adap-	No adaptation of turbocharger bypass position sensor (no previous adaptation occurred)	 Time after engine start > 0.3 s Pressure upstream throttle 0.0 - 543.40 kPa AAT >= -48° C ECT -40 - 120° C 	• 0.0 s • Once / DCY	• 2 DCY	 Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249. Checking", page 1172. Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.



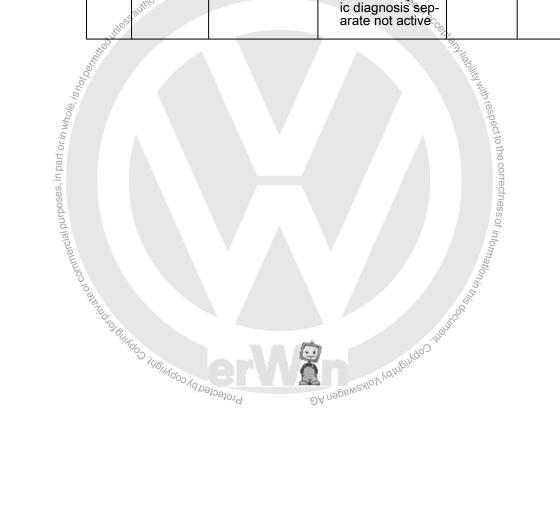
ton P2270 Sorper Sensors Sorper Sorper Signal Signal Blase d / Stuck Lean Bank 1 Sensor 2 Nax. OZS rear voltage < Vehicle speed >= 10 km/h	P2270 Oxygen Sensors Sensors (O2S) Rear Signal Biase d/ Stuck Lean Bank 1 Sensor 2 P2270 Oxygen Sensors (O2S) Rear Signal Range Check P2270 Oxygen Sensors (O2S) Rear Sensor 1 After Catalytic Converter Ca
	Fast trim control not calibrated Proportional part of secondary fuel control loop <

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Coasting function not active			
			Lambda adapta- tion not active			
		iced by Volkswag	Valve lift not oc.	not guara.		
		855 authoris	Temperature conditions:	un _{tee} o _f	r _{CC}	
			 ~~ Signal (tmot) > 60° C 		Drany John	
	is not be,		• ~~ Signal (tans) > -48° C		SIIIIAMITA	
	art or in whole,		 Modeled catalyst temperature once after engine start > 550° C 		respect to the	
	ourposes, in pa		 Modeled catalyst temperature @ start of diagnosis 500° C 		correctness of	
	or commercial F		 Modeled catalyst temperature dur- ing diagnosis 470 – 730° C 		information in	
	Stearn of the state of the stat	Mardo V.	 Lambda adaptation not active Valve lift not equipped Temperature conditions: ~Signal (tmot) > 60° C ~Signal (tans) > -48° C Modeled catalyst temperature once after engine start > 550° C Modeled catalyst temperature @ start of diagnosis 500° C Modeled catalyst temperature during diagnosis 470 - 730° C Integrated air mass, catalyst temperature during diagnosis 470 - 730° C Integrated air mass, catalyst temperature g Diff. between dynamic and standard g Diff. between dynamic and standard g Diff. between dynamic and standard g Start of diagnosis 	, Kido ^c .	ingred of the state of the stat	
		ected by copyrigh,	fulfilled not calibrated g Diff. between dynamic and stance tionary catalyst temperature @	SAIO V VOTALOIN		
		*1	tionary catalyst temperature @ start of diagnosis -254.0 – 254.0 K			
			 Diff. between dy- namic and sta- tionary catalyst temperature dur- ing diagnosis -304.0 – 304.0 K 			
			 Modeled EGT @ O2S front <= 1,201° C 			
			 Air mass conditions: 			
			 Air mass @ start of diagnosis 125.01 – 580.0 mg/stk 			
			Air mass during diagnosis not calibrated mg/stk			

DTC / De-	Monitor Strategy	Malfunction Cri- teria and Thresh-	Secondary Parameters with Enable	Monitoring Time	MIL Illumina- tion	Component Diagnostic Proce-
scrip- tion	Description	old Value	Conditions	Length		dure
			MAF per cylinder @ start of diagnosis 40.0 – 130.0 kg/h			
			MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			
			Load conditions:			
			Air mass set point 125.01 – 580.0 mg/stk	Y		
			Engine load not calibrated %			
			Accelerator pedal value not calibra- ted %	Ya.		^{А пэрвиг} мо V О Мар
			• For time >= 0.0 s	rotected by copy		Magewaylovia
			Low dynamic conditions:	70,	a	A Co
			Dynamic engine speed < 20 RPM			
			Dynamic air mass < 25.01 mg/ stk			
			Dynamic lambda controller output <= 20.0%			
			Integrated air mass after dy- namic conditions are fulfilled > 20.0 g			
			Evap purge con- ditions: Case 1			
			Evap purge valve not calibrated			
			Case 2:			
			Canister load cal- culation not cali- brated			
			Evap purge flow not calibrated			
			• Case 3:			
			Canister load not calibrated [-]			
			Evap purge flow not calibrated			
			Close the gap conditions:			

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			O2S rear voltage @ diagnosis start >= 0.55 V			
uniese	authorised by Volks	_W agen AG. Volkswager	 Integrated air mass @ start diagnosis >= 0.0 g O2S front dynamic diagnosis separate not active 	×		



Scription Conditions Length Conditions Conditions Length Conditions Condition	Seriotion Conditions Length dure dure		Monitor	Malfunction Cri-	Secondary Parame-		MIL Illumina-	Component Di-
Sensors Sensors Signal Signal Signal Barack Rich Bank 1 Sensor 2 Oxygen to be during peak min detection > 2.6 g Oxygen Sensors Signal Signal Signal Signal Sensor 1 After Catalytic Converter GX7. Refer to be a sensor 1 After Catalytic Converter GX7. Refer to be a sensor 1 After Catalytic Converter GX7. Refer to be a sensor 1 After Catalytic Converter GX7. Refer to be a sensor 1 After Catalytic Converter GX7. Refer to be a sensor 1 After Catalytic Converter GX7. Checking protection not active Catalytic Converter Catalytic Converter CAT. Checking Converter CAT. Checking Converter Catalytic Converter CAT. Checking Catalytic Converter CAT. Checkin	Sensors Sensors Signal Signal Signal Signal Signal Signal Signal Signal Check d/ Stuck Rich Bank I Sensor 2 Oxygen load during peak min detection > 2.6 g Min. O2S rear voltage > 0.25 Wehicle speed >= 10 kPa DCY Oxygen load during peak min detection > 2.6 g Oxygen Ser voltage > 0.25 Wehicle speed >= 0.0 kPa Catalyst over heating protection not active Turbine over heating protection not active Oxygen Ser sor 1 After Catalytic Converter GX7. Refe to 0 Oxygen Ser sor 1 After Catalytic Converter GX7. Refe to 0 Oxygen Ser sor 1 After Catalytic Converter GX7. Ched ing. Ozs front ready Ozs front ready Ozs front ready Internal resist- ance Ozs rear active Internal resist- ance Ozs rear 200.0 g Integrated heat energy >= 0.00 Impediate Active Impediate Active Impediate Active Impediate Active Impediate Active Integrated heat energy >= 0.00 Impediate Active Impediate Ac	scrip- De					tion	
	Proportional part of secondary fuel	P2271 Ox Se (Ox Signal Biase d/ Stuck Rich Bank 1 Sensor 2	Strategy escription kygen ensors (2S) Rear gnal ange neck	 Case 1: Min. O2S rear voltage > 0.25 V Oxygen load during peak min detection > 2.6 g Case 2: Min. O2S rear voltage > 0.25 V Oxygen load during peak min detection > 2.5 g Counter in case of suspected peak min error > 5,000.0 [-] 	ters with Enable Conditions General conditions Vehicle speed >= 10 km/h ARQ >= 0.0 kPa Catalyst over heating protection not active Turbine overheating protection not active O2S rear ready O2S heater rear active O2S front ready Internal resistance O2S rear <= 700.0 Ω Time after a catalyst purge phase >= 0.02 s Integrated heat energy >= 1,600.0 - 3,000.0 kJ Time after engine start > 230.0 - 1,000.0 s For 1.8L: Engine speed 1,344 - 3,008 RPM For 2.0L: Engine speed 1,344 - 3,008 RPM For 2.0L: Engine speed 1,344 - 3,008 RPM Deviation of lambda control value < 50.0% Deviation of lambda controller output @ start diagnosis < 10.0% Deviation of lambda controller output during diagnosis < 8.0 - 15.0% Fast trim control	Time Length • 86.5 s • Once / DCY	• 2 DCY	agnostic Procedure - Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking",

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Coasting function not active			
			Lambda adapta- tion not active			
			Valve lift not equipped			
			Temperature conditions:			
			• ~~ Signal (tmot) > 60° C			
			• ~~ Signal (tans) > -48° C			
			Modeled catalyst temperature once after engine start > 550° C AG. Volkswagen AG.			
	g School and the scho	authorised by Volkswagen	Modeled catalystotemperature @ start of diagnosis 500 – 700° C	t guarantee or acc		
	ill de la		Modeled catalyst temperature dur- ing diagnosis 470 – 730° C		Or BOALING WILL	
	arī or <i>in whole, is</i>	authorised by Volkswagen	 Integrated air mass, catalyst temp. conditions fulfilled not cali- brated g 		In respect to the c	
	ercial purposes, mp		after engine start > 550° C AG. Volkswagen AG. • Modeled catalyst temperature @ start of diagnosis 500 – 700° C • Modeled catalyst temperature during diagnosis 470 – 730° C • Integrated air mass, catalyst temp. conditions fulfilled not calibrated g • Diff. between dynamic and stationary catalyst temperature @ start of diagnosis -254.0 – 254.0 K • Diff. between dynamic and stationary catalyst temperature during diagnosis -304.0 – 304.0 K • Modeled EGT at O2S rear <= 1,201° C • Air mass conditions:		orrectness of infon	
	mmo to assuid to light	Protected by copyright, Co	 Diff. between dynamic and stationary catalyst temperature during diagnosis 304.0 – 304.0 K 		nation in this doctor	
	.46	AS HEILADO AD POLICIE	• Modeled EGT at O2S rear <= 1,201° C	Maylindoo ,		
		_ ₊₀ 9101 ^d	Air mass conditions:			
			Air mass @ start of diagnosis 125.01 – 580.0 mg/stk			
			Air mass during diagnosis not calibrated mg/stk			

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			MAF per cylinder @ start of diagno- sis 40.0 – 130.0 kg/h			
			MAF per cylinder during diagnosis 35.0 – 135.0 kg/h			
			Load conditions:			
			 Air mass set point 125.01 – 580.0 mg/stk 			
			Engine load not calibrated %			
			Accelerator pedal value not calibra- ted %			
			• For time >= 0.0 s			
			Low dynamic conditions:			
			Dynamic engine speed < 20 RPM			
			Dynamic air mass < 25.01 mg/ stk			
			Dynamic lambda controller output ≤20.0%			
	, nes al	norised by Volkswagen Ar	• Integrated airs not mass after dynamic conditions are fulfilled > 20.0	Harantee Or accept		
	OST MINO OF THE PROPERTY OF TH		Evap purge con- ditions: Case 1	(4	W lightlij	
	ne, isnot		Evap purge valve not calibrated		Withres	
D WA			Case 2		spect	
in part or i			 Canister load cal- culation not cali- brated 		and liability with respect to the correctness of information in this coc.	
Irposes,			Evap purge flow not calibrated		ectness	
Jalpi			• Case 3		of info	
	Comme		Canister load not calibrated [-]		^{ormation}	
	TO STENLY		Evap purge flow not calibrated		in this oo	
	Sammo Joan Maria do Colling of Chilado	746116	Close the gap conditions:	Jugurdo Jugur		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Intake Air (IA) System Rationality Check	Throttle opening area correction included controller and adaptation > 50.0%	modeled adapta- tion active (by throttle opening	• 5.0 s • Continuous	• 2 DCY	- Check for air leaks near the throttle body, oil fill cap not tight or oil dipstick not seated in
	part or in whole, is not bennited.	Lambda controller included correction and adaptage tion 28.0% Lambda controller active	 Throttle position 0.0 – 100.003° TPS Engine speed 576 – 3,008 RPM Pressure quotient @ throttle 0.27 – 0.60 [-] Fast throttle adaptation finished MAP gradient -200.0 – 200.0 kPa/s Fuel cut off not active Time after engine start > 5.0 s Turbo charger 	ot guarantee or act	anterwhile blind with respect to the correctn	tube. Also check for any engine gaskets that can cause additional air to enter the crankcase can set this fault as the PCV system is not metered. If a vacuum leak or crankcase seal is the cause, the idle may be rough or unstable.
	or commercial purpos	Edo interpression	Turbo charger boost pressure < 135.0 kPa BARO 73.0 – 107.5 kPa	o No montoo	rrectness of information in this ook	 Check the Intake Manifold Sensor GX9 - Refer to *3.6.20 Intake Manifold Sensor GX9, Checking", page 1139 . Check the Throttle Valve Control Module GX3 - Refer to *3.6.34 Throttle Valve Control Module GX3, Checking", page 1169 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Ratio adapted turbocharger boost pressure and actual turbocharger boost pressure > 35.0% Lambda controller included correction and adaptation -50.0 - 50.0% Lambda controller active 	modeled adaptation active (by turbocharger boost pressure) Throttle position > 4.50° TPS Engine speed 1,216 – 6,000 RPM Pressure quotient @ throttle 0.63 – 0.90 [-] Engine running Fast throttle adaptation finished MAP gradient -200.0 – 200.0 kPa/s Fuel cut off not active Time after engine start > 5.0 s Boost pressure 135.0 kPa BARO 73.0 – 107.5 kPa	agen AG. Volks		- Check the EVAP Canister Purge Regulator Valve 1 - N80 Refer to ⇒ "3.6.12 EVAP Canister Purge Regulator Valve 1 N80, Checking", page 1123 .
P2300 Igni- tion Coil "A" Pri- mary Con- trol Circuit Low	Ignition Coils Short To Ground	Ontbnt critery in our state > 0.00 - 100.0 my MA MA MA MA MA MA MA MA MA M	Engine speed >	• 0.8 s • Continuous	• 2 DCY	- Check the ig- nition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils With Power Output Stage . Checking",
P2301 Igni- tion Coil "A" Pri- mary Con- trol Circuit High	Ignition Coils Short To Battery Plus	 Diagnosis by inactive low side switch in ATIC: Output voltage in off state > 4.95 - 5.285 V 	Engine speed > 512 RPM Engine stop not active Actuator commanded off Actuator commanded off Actuator commanded off	• 0.8 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Diagnosis by inactive low side switch in ATIC: Output temperature from ATIC in on state > 160.0 – 200.0° C Output current in on state > 100.0 – 180.0 mA 	 Engine speed > 512 RPM Engine stop not active Actuator commanded on 			
Igni- tion Coil "A" Sec- on-	Ignition Coils Open Circuit	Output voltage in off state lower range >= 1.92 – 2.21 V Output volt√olks age in off state upper range <= 2.85 – 3.25 V	Engine speed > 512 RPM - ~ Signal (tco) > -30° C **agEngine stop not active es not guarante. **The company of the company	• 0.8 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2303- Igeo il Igeo il Bri-mary Circuit Circuit Vascodind I	Ignition Coils Short To Ground	Output current in on state > 50.0 – 100.0 mA	 Engine speed > 512 RPM ~~ Signal (tco) > -30° C Engine stop not active 	• 0.8 \$ • Continguous	respect to the correctness of i	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage. Checking", page 1133.
P2304 Igni- tion Coil "B" Pri- mary Con- trol Circuit High	Ignition Coils Short To Battery Plus	 Diagnosis by inactive low side switch in ATIC: Output voltage in off state > 4.95 - 5.285 V 	 Engine speed > 512 RPM Engine stop not active Actuator commanded off 	• 0.8 s • Continguous in the continguous in the contingue	2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Time	MIL Illumina- tion	Component Diagnostic Procedure	
		 Diagnosis by inactive low side switch in ATIC: Output temperature from ATIC in on state > 160.0 – 200.0° C Output current in on state > 100.0 – 180.0 mA 	Engine speed > 512 RPM Engine stop not active Actuator commanded on	_{ksw} agen AG. V	olkswagen AG doe	- Check the Ig-	Thability with re-
P2305 Igni- tion Coil "B" Sec- on- dary Circuit	Ignition Coils Open Circuit	Output voltage in off state lower range in state lower range in state lower range in off state lower range in off state lower range in	Signal (tco) > -30° C Engine stop not active	• 0.8 s • Continuous	• 2 DCY	with Power Output Stage . Refer to ⇒ "3.6.17 Ig- nition Coils	-mation in this of
P2306 Ignition Coil "C" Primary Control Circuit Low	Ignition Coils Short To Ground	Output current in on state > 50.0 – 100.0 mA		• 0.8 s • Continuous	• 2 DCY	nition Coils with Power Output Stage . Refer	S.
P2307 Ignition Coil "C" Primary Control Circuit High	Ignition Coils Short To Battery Plus	 Diagnosis by inactive low side switch in ATIC: Output voltage in off state > 4.95 - 5.285 V 		0.8 sContinuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	800	 Diagnosis by inactive low side switch in ATIC: Output temperature from ATIC in on state > 160.0 - 200.0° C Output current in on state > 100.0 - 180.0 mA 	Engine speed > 512 RPM Engine stop not active Actuator commanded on manded on the second secon	a does not gu _{alfal}	Nee of ace of any lighting	
P2308 Igni- tion Coil "C" Sec- on- dary Circuit	Ignition Coils Open Circuit orin Model as No.	 Output voltage in off state lower range >= 1.92 - 2.21 V Output voltage in off state upper range <= 2.85 - 3.25 V 	 Engine speed > 512 RPM ~~ Signal (tco) > -30° C Engine stop not active 	• 0.8 s • Continuous	• 2 DCY	Check the Ignition Coils with Power Output Stage. Refer to \$\installer \text{"3.6.17 Ignition Coils} \text{With Power Output Stage.} \text{Uthous Checking."} \text{Checking."} \text{page 1133}.
P2309 Ignition Coil "D" Primary Control Circuit Low	Ignition Coils Short	Output current in on state > 50.0 - 100.0 mA MACHONIAGO MACHONI	• Engine speed > 512 RPM • ~~ Signal (tco) > -30° C • Engine stop not active	• 0.8 s • Continuous	• 2 DCY	Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P230 A Cylinder 1 Air- Fuel Ratio Imbalance - Ad- just- ment Limit Dur- ing Balance	Fuel System Misfire Monitoring Rationality Check	Cylinder misfire counter > 10.0 [-]	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] Catalyst heating not active Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure >= 0.0 kPa Mass fuel flow set point 12.0 – 29.99 mg/stk Segment adaptation completed Lambda control closed loop Catalyst purge not active VolCanister load <= 2.0 f.1 	• Once / DCY	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.14 Fuel Injectors , Checking", page 1127 . - Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 . - Check the Oxygen Sensor 1 After Catalytic Converter - GX10, Checking", page 1152 .
, raial purposes, in part or in who,	Manual of tous, some season of the season of	Protected by Aou	 Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start > 0.0 [-] Time after engine start > 0.0 s Integrated mass air flow >= 0.75 - 7.0 kg Rough road not detected For 1.8L: Engine speed 1,248 - 2,816 RPM For 2.0L: Engine speed 1,440 - 3,008 RPM Dependence on oxygen sensor diagnosis Oxygen sensor diagnosis finished not calibrated 	taraniee or acception	nd liability with respect to the correctness of information in this open	to ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 1149.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL	. Illumina- tion	Component Diagnostic Procedure
art or <i>in whol</i>	Steinedos inteinedos		 Oxygen sensor delay diagnosis finished not cali- brated 	specific	et to the C		
s, in p			 Diagnosis at gear 		orrec		
ourpose			1st gear not active		e correctness of		
nercialF			 2nd gear not active 	THIOMATION IN THIS QUOTE THE PROPERTY OF THE P			
eorcom			 3rd gear not active 	ation in th			
JENIH.			4th gear active	200			
7	OUIS		5th gear active	. Illohii.			
	1000 JUS		6th gear active	D			
	COPYTIE	(qpara	7th gear active				
		Protoeto	• 98th gear not active				
			Limited dynamic conditions				
			 Dynamic engine speed < 75 RPM 				
			 Dynamic MAF < 29.99 mg/stk 				
			 Dynamic torque request < 0.10 [-] 				
			Dynamic window lambda control < 5.0 %				
			 Dynamic ignition angle < 0.10 [-] 				
			 Additional conditions 				
			 Cylinder balanc- ing diagnosis of all cylinders ac- tive 				

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P230 B Cylin- der 2	Fuel Sys- tem Misfire Monitoring Rationality	Cylinder mis- fire counter > 10.0 [-]	Modeled catalyst temperature <= 900° C	4 timesOnce / DCY	• 2 DCY	- Check the Fuel Injec- tors . Refer to ⇒ "3.6.14
Air- Fuel	Check		 Lambda set value 0.97 – 1.03 [-] 			Fuel Injec- tors, Check-
Ratio Imbal- ance -			 Catalyst heating not active 			<u>ing",</u> page 1127 .
Ad- just- ment			 Fuel cut off not active 			Check the Oxygen Sen- sor 1 Before
At			• ECT 60 – 143° C			Catalytic
Limit Dur-			• AAT >= -48° C			Converter - GX10 Re-
ing Bal- ance			 Barometric pres- sure >= 0.0 kPa 			fer to ⇒ "3.6.26 Oxygen Sen-
ance			 Mass fuel flow set point 12.0 – 29.99 mg/stk 			sor 1 Before Catalytic Converter
			 Segment adaptation completed 			GX10 , Checking", page 1152
			 Lambda control closed loop 			- Check the Oxygen Sen-
			 Catalyst purge not active 			sor 1 After Catalytic
		, alkswagen AG. Volksw	• Canister load <=			Converter - GX7 Refer to
	yisedby	dou.	 No gear shift anice For segments 			<u>⇒ "3.6.25</u> Oxygen Sen-
	nless author		• For segments 90.0 [-]	accon.		sor 1 After Catalytic
illi Kili Ko	55		 Segments after start > 0.0 [-] 	accepted Middlin Mith response		Converter GX7 , Check- ing",
i, is noto			• Time after engine start > 0.0 s	TO WHAT		page 1149.
corin whole			 Integrated mass air flow >= 0.75 – 7.0 kg 			
s, III par			 Rough road not detected 		to the correctness	
et purpose		_{Volksw} agen AG. Volksw	 For 1.8L: Engine speed 1,248 – 2,816 RPM 		O _f	
orcommerc			 For 2.0L: Engine speed 1,440 – 3,008 RPM 	Ormation in 1		
O'EVILA"	31041x		Dependence on oxygen sensor di- agnosis	""Ormation in this country		
	Stalledoo stalingoo	Protected by	Oxygen sensor of dynamic diagnosis finished not calibrated	D		

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			Oxygen sensor delay diagnosis finished not cali- brated			
			Diagnosis at gear			
			1st gear not active			
			2nd gear not active			
			3rd gear not active			
			4th gear active			
			5th gear active			
			6th gear active			
			7th gear active			
			8th gear not active	www.agen.AG.\	^r olkswagen AG do.	
			 8th gear not active Limited dynamic conditions Dynamic engine speed < 75 RPM 	JK24.		PS Not guarantee
			Dynamic engine speed < 75 RPM			Of ACCEDIA
			Dynamic MAF < 29.99 mg/stk			
			Dynamic torque request < 0.10 [-]			
		in part or in we	Dynamic window lambda control < 5.0 %			
		es, in par	Dynamic ignition			
		alburposes,	Additional conditions			
		, is	Cylinder balanc- ing diagnosis of all cylinders ac- tive			"III;
			*RILLITOTE BILLOOD THE INGODE	Protected	SDA Nego.	Westlo V Walter Wood of the Mark Westler Washington of the Westler Was

DTC / Mon De- Strate Descri tion	egy teria and Thres		Monitoring Time Length	MIL Illumina-	Component Diagnostic Procedure
P230 C tem Mi Monito Rational Check Fuel Ratio Imbalance - Adjustment At Limit During Balance	sfire fire counter ring 10.0 [-]	> temperature <=	- DCA	• 2 DCY	Check the Fuel Injectors . Refer to 3.6.14 Fuel Injectors . Checking". page 127 . Check the Oxygen Sensor 1 Before Catalytic Converter GX10. Checking". page 1152 . Check the Oxygen Sensor 1 After Catalytic Converter GX7 . Refer to 3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7 . Refer to 3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7 . Checking". page 1149 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
			 Oxygen sensor delay diagnosis finished not cali- brated 			
			 Diagnosis at gear 			
			 1st gear not active 			
			 2nd gear not active 			
			3rd gear not active tive 4th gear active	vagen AG does i	70 _{t 011}	
		Morie	• 4th gear active		a darantee	
		1855 aut	 5th gear active 		Oracco	
		:#cdull	6th gear active		X	92
		DOT WILL	7th gear active			lab lili
		le, is not	8th gear not active			ywith res
		rin who	Limited dynamic conditions			spectto
		Inpart	 Dynamic engine speed < 75 RPM 			the corre
		rposes,	 Dynamic MAF < 29.99 mg/stk 			ectness
		ercial pu	Dynamic torque request < 0.10 [-]			of infort
		ie or comme	 Inished not call-brated Diagnosis at gear 1st gear not active 2nd gear not active 3rd gear not active 4th gear active 5th gear active 6th gear active 7th gear active 8th gear not active Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0 % Dynamic ignition angle < 0.10 [-] Additional condi- 			nation in this
		MINTO SOLIT	Dynamic ignition angle < 0.10 [-]		n la	N N N N N N N N N N N N N N N N N N N
		1460 1460	 Strategear not active 4th gear active 5th gear active 6th gear active 7th gear active 8th gear not active Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0 % Dynamic ignition angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active 	.DA nagswe	MOV LOMBINGOO, Ing	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P230 D Cylin- der 4 Air- Fuel	Fuel System Misfire Monitoring Rationality Check	• Cylinder misfire counter > 10.0 [-]	 Modeled catalyst temperature <= 900° C Lambda set value 0.97 – 1.03 [-] Catalyst heating not active swagen A Fuel cut off not active ECT 60 – 143° C AAT >= -48° C Barometric pressure >= 0.0 kPa Mass fuel flow set point 12.0 – 29.99 mg/stk Segment adaptation completed Lambda control closed loop Catalyst purge not active Canister load <= 2.0 [-] No gear shift For segments 90.0 [-] Segments after start > 0.0 [-] Time after engine start > 0.0 [-] Segments after start > 0.0 [-] Rough road not detected For 1.8L: Engine speed 1,248 – 2,816 RPM For 2.0L: Engine speed 1,440 – 3,008 RPM Dependence on oxygen sensor dynamic diagnosis Oxygen sensor diagnosis finished not calibrated Oxygen sensor diagnosis finished not calibrated 	• Once / DCY	• 2 DCY	Catalytic Converter GX10 Checking", page 1152 Check the

P2310 Ignition Gois Short to Diagnosis by a degree of the plant to regular to a control conditions P2310 Ignition Folia Short to Battery Cool To Battery Cool To Battery Cool To Cool To Battery Cool To Cool To Battery Cool To Cool	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
- 1st gear not active - 2nd gear not active - 3rd gear not active - 4th gear active - 5th gear active - 6th gear active - 7th gear active - 8th gear not active - 1tive - 1tive - 1tive - 1tive - 4th gear active - 6th gear active - 1tive -				delay diagnosis finished not cali-				
tive 2 2nd gear not active 3rd gear not active 4th gear active 5th gear active 6th gear active 6th gear active 7th gear active 9 8th gear not active 1 Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic torque request < 0.10 [-] Dynamic torque request < 0.10 [-] Dynamic ignition angle < 0.10 [-] Cylinder balancing diagnosis of all cylinders active 1 Engine speed > 0.8 s				Diagnosis at gear				
tive 3rd gear not active 4th gear active 5th gear active 6th gear active 7th gear active 1 Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic myles Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0 % Dynamic ignition angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active Engine stop not active 1 Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic ignition angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active Engine speed > 0.8 s Continuous Coli Diagnosis by inactive low side switch in ATIC: Output voltage in off state in Actual com- Coult put voltage in off state in Actual com- A								
tive 4th gear active 5th gear active 6th gear active 7th gear active 1tive Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.40 [-] Dynamic window lambda control < 5.0.% Dynamic ignition angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active low side switch in ATIC. Plus Pilus Pilus Diagnosis by inactive low side switch in ATIC. Output voltage in off state Actuator com-								
- 5th gear active - 6th gear active - 6th gear active - 7th gear active - 8th gear not active - Limited dynamic conditions - Dynamic engine speed < 75 RPM - Dynamic torque request < 0.10 [-] - Dynamic torque request < 0.10 [-] - Dynamic ignition angle < 0.10 [-] - Additional conditions - Oils Short To Battery Plus - Coil - To Battery Plus - Output voltage in off state - Actuator com-								
P2310 Ignition Coils Short To Battery Plus Pin Battery Plus Pin Battery Pus Prince Plus Pin Battery Pus				4th gear active				
P2310 Ignition Coils Short To Battery Plus To Battery Plus To Battery Primary Output voltage in age in off state shows a condition and in a condit				5th gear active				
Bth gear not active Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0% Dynamic ignition angle < 0.10 [-] Additional condition Colis Short To Battery Plus To Battery Plus Diagnosis by inactive low side switch in ATIC: Diagnosis by inactive low side switch in ATIC: Output voltage in off state age in off state Actuator com- Adduator com- Continuous Continuous Continuous To 6 17 Inc. To 7 1 Inc. To 7 Inc. To				6th gear active				
tive Limited dynamic conditions Dynamic engine speed < 75 RPM Dynamic MAF < 29.99 mg/stk Dynamic torque request < 0.10 [-] Dynamic window lambda control < 5.0.% Dynamic ignition angle < 0.10 [-] Additional conditions Cylinder balancing diagnosis of all cylinders active P2310 Ignition Coils Short To Battery Plus To Battery Plus Diagnosis by inactive low side switch in ATIC: Actuator com- To Output voltage in off state age in off state Actuator com-				7th gear active				
P2310 Ignition Coils Short To Battery Pire To								
P2310 Ignition Coils Short To Battery Plus Pri- mary Pri- mary P2310 Ignition Coil Short To Battery Pri- mary Pri- mary Pari- mary P				Limited dynamic conditions				
P2310 Ignition Coils Short To Battery Plus Pri- mary Pri- mary P2310 Ignition Coil Short To Battery Pri- mary Pri- mary Pari- mary P				 Dynamic engine speed < 75 RPM 				
P2310 Ignition Coils Short To Battery Plus Pri- mary Part To Battery Pri- mary Part To Battery Plus Pri- mary Pri- mary Part To Battery Plus Pri- mary Part To Battery Plus Pri- mary Part To Battery Plus Pri- mary Pri- mary Part To Battery Plus Pri- mary Part To Battery Plus Pri- mary Part To Battery Plus Pri- mary Pri- mary Part To Battery Plus Plus Plus Plus Plus Plus Plus Plus				Dynamic MAF < 29.99 mg/stk	Volkswagen A	G. Volkswagen AG	doesnos	
P2310 Ignition Ignition Coils Short To Battery Pri- Pri- Pri- Pri- Pri- Pri- Pri- Pri-				 Dynamic torque^d 			Guarantee or	
P2310 Ignition Coils Short To Battery Plus Pri- mary Part To Battery Pri- mary Part To Battery Plus Pri- mary Pri- mary Part To Battery Plus Pri- mary Part To Battery Plus Pri- mary Part To Battery Plus Pri- mary Pri- mary Part To Battery Plus Pri- mary Part To Battery Plus Pri- mary Part To Battery Plus Pri- mary Pri- mary Part To Battery Plus Plus Plus Plus Plus Plus Plus Plus				lambda control <			RC RC	POLANY II OF
P2310 Ignition Coils Short To Battery Primary Control Circuit High				Dynamic ignition angle < 0.10 [-]				SIII W
P2310 Ignition Coils Short To Battery Plus Primary Control Corrouit High								
P2310 Ignition Coils Short To Battery Plus Primary Control Circuit High				ing diagnosis of all cylinders ac- tive				
tion Coil To Battery Plus Pri- mary Con- trol Circuit High		Ignition	Diagnosis by inactive low	Engine speed >	• 0.8 s	• 2 DCY	- Check the Ig-	
Pri- mary Con- trol Circuit High	tion Coil	To Battery	side switch in ATIC:	• Engine stop not			with Power Output	
Control Circuit High	Pri- mary		age in on state	0,			Stage . Refer to ⇒ "3.6.17 lg-	on in this
High Stage 2	trol			Hoto Other		4.	nition Coils With Power Output	Only
Tight Checking". page 133.	High			146 UND	lar		Stage, 100	

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
		 Diagnosis by inactive low side switch in ATIC: Output temperature from ATIC in on state > 160.0 – 200.0° C Output current in on state > 100.0 – 180.0 mA 	 Engine speed > 512 RPM Engine stop not active Actuator commanded on 			
P2311 Igni- tion Coil "D" Sec- on- dary Circuit	Ignition Coils Open Circuit	authoris	 Engine speed > en A512 RPMJen AG does ~~ Signal (tco) > -30° C Engine stop not active 	• 0.8 s • Continuous	• 2 DCY	- Check the Ignition Coils with Power Output Stage . Refer to ⇒ "3.6.17 Ignition Coils With Power Output Stage . Checking", page 1133 .
P2400 EVAP Sys- tem Leak De- tec- tion Pump Con- trol Cir- cuit/ Open	Evaporative Emission (EVAP) Leak Detection Pump (LDP) Open Circuit	age, lower range 1.92 – 2.21 V	Actuator commanded off	• Continuous	to the correctness of $information h_{th}$	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.
P2401 EVAP Sys- tem Leak De- tec- tion Pump Con- trol Circuit Low	Evaporative Emission (EVAP) Leak Detection Pump (LDP) Short To Ground	• Output volt- age < 1.92 – 2.21 V	Actuator commanded off Actuator commanded off	2.0 s Continuous, rdo sylon Kanyling	1 32 DC1	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .

DTC / De- scrip- tion	Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure	
EVAP Sys- tem	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Battery Plus	perature > 160 – 200° C Output current	Actuator com- manded on	2.0 sContinuous	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144, Checking", page 1143.	
P2407	Evaporative Emission (EVAP) System Sig- nal Check	 Pump current oscillation > 1.5 mA Number of aborted leak measurements due to pump current oscillations > 0.0 [-] 	 BARO > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) Airbag not activated 	Once / DCY en A NOINS WAR en A	G. Volkswagen Ac	- Check the Leak Detection Pump - V144- Refer to 3.6.22 Leak Detection Pump V144 Checking". page 1143.	examinability with respect to the correctness of information in this occurrence.
A EVAP Sys- tem	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Open Circuit	age lower range 1.92 – 2.21 V	Actuator commanded off Actuator community Actuator community	 0.3 s Continuous 	· 2 DCY	- Check the Leak Detection Pump - V144- Refer to ⇒ "3.6.22 Peak Detection Pump V144, Checking", page 1143.	author and a second

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P240 B EVAP System Leak Detection Pump Heater Control Circuit Low	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Ground	Output voltage < 1.92 – 2.21 V age < 1.92 – 2.21 V integration is entired with the state of t	Actuator Com-Ikswa manded off	• Continuous	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .
P240 C EVAP Sys- tem Leak De- tec- tion Pump Heat- er Con- trol Circuit High	Evaporative Emission (EVAP) Leak Detec- tion Pump (LDP) Short To Battery Plus	Actuator temperature > 160 - 200° C Output current > 4.0 - 7.0 A Pump current correction >	Actuator commanded on	0.3 sContinuous	• 2 DCY	- Check the Leak Detec- tion Pump - V144 Refer to 3 3.6.22 Leak Detec- tion Pump V144. Checking", page 1143.
P2414 O2 Sen- sor Ex- haust Sam- ple Er- ror Bank 1 Sen- sor 1	Oxygen Sensors (O2S) Front Rationality Check	Pump current correction > 1.2 mA (nernst-cell)	 O2S front ready Fuel cut off not active Injection mode change (DFI/MFI) not active Depending on engine state: Engine part load Engine full load Engine idle For time >= 3.0 s 	• √10.0 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152 .

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2431 AIR System Air Flow/ Pressure Sen- Sor Circuit Rang e/Per- for- manc Bank 1	Air Injection (AIR) Pres- sure Sensor Rationality Check	Difference between AIR pressure and barometric pressure > 6.0 kPa Difference between AIR pressure and intake manifold pressure > 6.0 kPa Sealor Nolkewagen AG. Viscolar Viscolar AG. Viscolar Viscolar AG. Viscolar A	• Engine stop • For time > 0.0 s	• 0.1 s • Multiple	to with respe	- Check the Secondary Air System - GX24 - Refer to ⇒ "3.6.32 Secondary Air System GX24 , Checking", page 1165 . - For Beetle, check the Secondary Air Injection Sensor 2 - G610 - Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610 , Checking", page 1161 .
AIR System Air Flow Pres- sure Seri- sor	Air Injection (AIR) Pres- sure Sensor Out Of Range Low	• Sensor voltage < 0.50 V	JA negswayo V Voj	• 0.1 s • Continuous	CY D the correctness of Information ii	- Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24. Checking", page 1165 For Beetle, check the Secondary Air Injection Sensor 2 - G610 Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610. Checking", page 1161.

	Generic Sca	an Iool - Edition 12	2.2011	SWagon	does does	not guar
DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2433 AIR System Air Flow/ Pressure Sensor Circuit High	Secondary Air Injection (AIR) Pres- sure Sensor Out Of Range High	Sensor voltage > 4.50 V Vision in part or in whole is a serial purposes. Output Description in the content of the cont	mu _{bello}	• 0.1 s • Continuous	• 2 DCY	- Check the Secondary Air System - GX24 Refer to ⇒ "3.6.32 Secondary Air System GX24, Checking", page 1165 .
Bank 1		mmercial pu	• General:	atoetor4		- For Beetle, check the Secondary Air Injection Sensor 2 - G610 Refer to ⇒ "3.6.30 Secondary Air Injection Sensor 2 G610. Checking", page 1161.
P2440 AIR System Switching Valve Stuck Open Bank 1	Secondary Air Injection (AIR) Valve Functional Check	 For 1.8L: Ratio relative pressure phase 1 and relative pressure phase 2 > 1.50 [-] For 2.0L: Ratio relative pressure phase 1 and relative pressure phase 2 > 1.30 [-] 	 General: AIR pump active Catalyst heating active AIR active MAF 140.0 kg/h ~Signal (tco) >= -10; < 115° C IAT @ manifold >= -10; < 100° C Modeled catalyst temperature < 700° C Relative barometric pressure > 0.73 [-] Diff. BARO vs. MAP not calibrated kPa Engine not calibrated 	• 0.1 s • Once / DCY	• 2 DCY	- Check the Secondary Air Injection Solenoid Valve - N112 - Refer to ⇒ "3.6.31 Secondary Air Injection Solenoid Valve N112, Checking", page 1163 . - Check the Secondary Air Injection Pump Relay - J299 - / Secondary Air Injection Pump Motor - V101 Refer to ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157 .

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DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
EVAP Sys- tem	Evaporative Emission (EVAP) System Ra- tionality Check	Time after measurement start > 2.0; < 2.5 s Drop of evap pump current < 3.0 mA	 BARO > 73.0 kPa AAT 4 - 38° C ECT @ start >= 4° C Vehicle speed < 1 km/h Time since engine start in preceding dcy >= 600.0 s Difference between ECT and AAT @ start not calibrated K Propulsion off time >= 21,600.0 s Engine stop (during ECM keep alive-time) Airbag not activated 	• Once / DCY	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ "3.6.22 Leak Detection Pump V144 . Checking", page 1143 .
Tur- bo- charg- er Boost	Turbo- charger (TC) By- pass Posi- tion Sensor Adaptation Monitoring: Functional Check	Boost pres-sure actuator sensor voft-age > 4.5%; < 2.73 V 2.73 V 2.73 V 2.73 V 2.73 V 3.70 April 10 A	• Gradient of boost pressure >= -2.98%/s	• 0.3 s • Continuous	• 2 DCY	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
P2564 Turbocharger Boost Control Position Sensor "A" Circuit Low	Turbo- charger (TC) Posi- tion Sensor Circuit Low	Turbocharger boost control position sen- sor voltage < 0.20 V	C. O. BUILAGO TUBUAGO APPADA	• 0.5 s • Continuous	• 2 DCY	- Check the Actuator - V465 Refer

DTC / Moni De- Strate scrip- tion	egy teria and Thresh-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
P2565 Turbo- charger bo- charger er Boost Con- trol Posi- tion Sen- sor "A" Circuit High	position sensor sor voltage >	kswagen AG does not guarante	• 0.5 s • Continuous	• 2 DCY	- Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113.
P2610 Engine ECM Time R PCM tionality Engine Off Timer Per-	Off of Difference be- tween engine-	Monitor entry conditions:	• 10.0 ms • Once / Tocy		- Check power and ground inputs to ECM first. Refer to appropriate wiring schematic for pin locations. If all powers/ grounds to ECM are present, replace the Engine Control Module - J623 Refer to appropriate repair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	Engine Off Time ECM Internal	ECM internal timer failure	 SPI initialization finished 	1.3 sContin-		
	Timer Check	ECM internal timer signal not calibrated		uous		
		ECM internal timer not cali- brated				
		Time after last engine stop not calibrated h	_{sed} by ^V olkswagen AG. Volks	wagen AG does	not guarantee	
P3043 Fuel Pump Me- chani- cal Mal- func- tion	Fuel Pump Control Module (FPCM) Functional Check: Pump Blocked	• Phase current > 20.0 A		1.0 sContinuous	• 2 DCY %	- Check the Fuel Delivery Unit - GX1-/ Fuel Pump Control Mod- ule - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Mod- ule J538 , Testing", page 1125 .
P3044 Fuel Pump "A" Con- trol Circuit Low		Phase current > 25.0 A Internal check	Projected by Copyrig	• 1.0 s • Continuous	• 2 DCY	- Check the Fuel Delivery Units GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .
P3045 Fuel Pump Elec- tron- ics Faulty	Module (FPCM) Functional Check:	Internal check failed		• 1.0 s • Continuous	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Module J538 , Testing", page 1125 .

DTC / De- scrip- tion	Monitor Strategy Description	old Value	Secondary/Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
Fuel Pump "A" Con- trol Cir- cuit/ Open	cnit crin whole, is not not in whole, is not	• Phase current		1.0 sContinuous		ule - J538 Refer to ⇒ "3.6.13 Fuel Delivery Unit GX1 / Fuel Pump Control Mod- ule J538, Testing", page 1125
P334 A Actua- tor Elec- trical Error	Turbo- charger (TC) Boost Pressure Control Short Cir- cuit	Bypass valve driver current> 9.3 – 15.0 A Representation of the second se	• Boost pressure control active	• 0.4 s • Continuous	• 2 DCY	Check the Actuator - V465 Refer to ⇒ "3.6.7 Charge Air Pressure Actuator V465, Checking", page 1113 . Check the Turbocharger Recirculation Valve - N249 Refer to ⇒ "3.6.35 Turbocharger Recirculation Valve N249, Checking", page 1172 .
U000 1 High Speed CAN Com- muni- cation Bus	CAN: Pow- ertrain Reading Back Sent Message	Message no feedback	Time after ignition on 0.5 s	0.5 sContinuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109
U000 2 High Speed CAN Com- muni- cation Bus Per- for- manc e	CAN: Pow- ertrain Communi- cation Check	Global time out >= 0.4 s	Time after ignition on >= 0.5 s	0.5 sContinuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U010 1 Lost Com- muni- cation with TCM	COM: Transmis- sion Control Module (TCM) Communi- cation With TCM	Received message no message	Time after ignition on 0.5 s	• 1.0 s • Continuous	• 2 DCY	- Check the CAN-Bus terminal resistance between the Transmission Control Module and the Engine Control Module - J623 - Refer to 3.6.6 CAN-Bus Terminal Resistance, Powertrain, Checking", page 1112 .
	COM: Brake System Control Module (BSCM) Communication With BSCM	Received message no message	• Time after ignition on >= 0.5 s	0.5 s Continuous agen AG. Volks	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109.
U014 0 Lost Com- muni-	COM: Body Control Module (BCM) Communi- cation With BCM	Received message no message Received message no message Received message no message Received message no message n	Time after ignition on 0.5 s	• 2.0 s • Continuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to
U014 6 Lost Com- muni- cation With Gate- way "A"	COM: Gate- way Com- munication With Gate- way	Received message no message no message	• Time after ignition on >= 0.5 s	• 0.5 s • Continuous	• 2 DCY	"3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109 . - Check the CAN-Bus terminal resistance. Refer to "3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
			THE TOTALISTICS THEILAGO VODOR	erV/		OA KORNODINGOO INGUIRO
				Profe	3. Diadı	nosis and Testing 96

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
U015 5 Lost Communication With Instrument Panel Cluster (IPC) Control Mod-	COM: In- strument Panel Clus- ter (IPC) Communi- cation With IPC	Received message no message authoriseaby Volkswagen authoriseaby Volkswagen authoriseaby Volkswagen	Time after ignition on 0.5 s AG. Volkswagen AG does not be a second to be a	• 5.0 s • Continuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking, page 1109.
ule	# # P	D. 1115			2/3	
U030 2 Soft- ware In- com- pati- bility With Trans- mis- sion Con- trol Mod- ule	Engine Control Module (ECM): Coding Code Check Of ECM Concerning TCM	Received A/T vehicle data TCM signal		• 50.0 s • Continuous	C C C Whith respect to the correctness of information 2	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module. Refer to appropriate repair manual.
U032 3 Soft- ware In- com- pati- bility With Instru- ment Panel Con- trol Mod- ule	COM Ambient Air Temperature (AAT)	• Ambient temperature sensor: Source configuration failure	• Time after ignition on > 1.2 s	• 1.0 s • Continuous	• 2DCY	- Check for correct soft-ware version and VIN or update soft-ware for the IPC Module if available. If OK, replace the Instrument Cluster Control Module - J285 Refer to appropriate repair manual.
U040 2 Invalid Data Re- ceived From TCM	COM: Transmis- sion Control Module (TCM) Communi- cation With TCM	Received data implausible message	Time after ignition on 0.5 s	• 0.3 s • Continuous	• 2 DCY	 Check for software up- dates and TSB's. Re- program as necessary. If none are found, re- place the Transmis- sion Control Module . Re- fer to appro- priate repair manual.

	DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	U041 5 Invalid Data Re-	COM: Vehi- cle Speed Sensor (VSS) Com- munication	Speed sensor signal: sensor error 327.42 km/h	Time after ignition on > 500.0 ms	• 0.5 s • Continuous	• 2 DCY	Check the CAN-Bus terminal resistance. Refer to
	ceived From Anti- Lock Brake	• NKSW8Q	signal: initiali- zation error 327.08 km/h				⇒ "3.6.5 CAN- Bus Terminal Resistance, Checking",
	Sys- tem (ABS) Con- trol		Speed sensor signal: low voltage error gen 327.25 km/h 40	a does not			page 11 <u>09</u> .
۰	Mod- ule ule	horisedby	Speed sensor signal: range error 326.40 – 327.07 km/h	a does not guarantee or acceptante			
or commercial purposes, in part or in whole, is not being.			signal: range error 327.09 – 327.24 km/h		uith respect to the correctness of information in the contraction of t		
			 Speed sensor signal: range error 327.26 – 327.41 km/h Speed sensor 		pect to the corre		
srcial purposes		COM:	signal: range error 327.43 – 327.67 km/h	Time after igni-	ctness of info _n		
on comme	TO TO CHINDO	Brake System Control Module (BSCM) Communication With	implausible message	auro			
	dirdo	venicie	Vehicle speed	Julindoo it	• 2.0 s		
		Speed Sensor (VSS) Rationality Check High	> 325 km/h	SEWSHOV KUMBINGOD FINE	Continuous		
	Data Re- ceived From	COM: Ambient Air Temperature (AAT) Sensor Communication With IPC	Ambient tem- perature sen- sor: source in reset failure	 Time after ignition on > 1.2 s Engine running 	2.0 sContinuous	• 2 DCY	 Check for correct soft- ware version and VIN or update soft- ware for the IPC Module if available. If
	ment Panel Clus- ter Con- trol Mod- ule	COM: Ambient Air Temperature (AAT) Sensor Communication With AAT Sensor	Ambient air temperature signal failure	Time after ignition on > 0.5 s	0.6 sContinuous		OK, replace the Instru- ment Cluster Control Mod- ule - J285 Refer to ap- propriate re- pair manual.

DTC / De- scrip- tion	Monitor Strategy Description	Malfunction Cri- teria and Thresh- old Value	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	MIL Illumina- tion	Component Diagnostic Procedure
	COM: In- strument Panel Clus- ter (IPC) Communi- cation With IPC	Received data implausible message	Time after ignition on 0.5 s	• 3.0 s • Continuous		
U044 7 Invalid Data Re- ceived From Gate- way "A"	COM: Gate- way Com- munication With Gate- way	implausible	Time after ignition on >= 0.5 s Swagen AG. Volkswagen AG.	• 0.5 s • Continuous	• 2 DCY	- Check the CAN-Bus terminal resistance. Refer to 3.6.5 CAN-Bus Terminal Resistance, Checking", page 1109
U110 3 Pro- duc- tion Mode Active	Engine Control Module (ECM): Pro- duction	Production mode active	 Vehicle speed < 5 km/h Max trip mileage since initial vehicle start-up < 100 km During ECM keep alive-time after ignition off Engine speed 0 RPM For hybrid: Drive motor off 	• 0.01 s • Continuous	• 1 DCY DILLIAM	to appropriate repair manual for resolution. Note the mode can be deactivated with a factory scan tool or

3.5

- #3.5.1 Transmission Control Module ? Sepeed 02E (2013 2015 MY)", page 969

 ⇒ "3.5.2 Transmission Control Module ? MY)", page 999
- \Rightarrow "3.5.3 Transmission Control Module, 6 speed 0D9 (2017 MY)", page 1032
- \Rightarrow "3.5.4 Transmission Control Module, 6 speed 0D9 (2018 MY)", page 1062

Transmission Control Module , 6 speed 02E (2013 – 2015 MY) 3.5.1

			DQ-2	50 6F 02E			To de la companya de
DTC	Fault Code De- scription	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0219	Engine Over- speed Condition	Signal range check check rubart ori	Rotational speed of gearbox input shaft exceed a maximum value	Rotational speed> 12,000 RPM	Terminal 15 voltage > 4.0 V for more than 500.0 ms	• 500.0 ms	2 driv- ing cy- cles
P0501	Vehicle Speed Sensor "A" Cir- cuit Range/ Perform- ance	Plausibility check	calculate the speed of input shaft with the gear ratio of engaged gear on input shaft speed. compare the calculated speed with measured speed of input shaft	• Speed difference magnitude > 330 RPM (output speed = 500 RPM) - 100 RPM (output speed >= 2,000 RPM)	No valid CAN output speed information	• 300.0 ms	• 2 driv- ing cyd- cles
P0701	Trans- mission Control System Range/ Perform- ance	Signal range check	 Travel sensor voltage gearshift fork 1/3 out of plausibility range Travel sensor voltage gearshift fork 2/4 out of plausibility range 	 Voltage < 100.0 mV Or Voltage > 4,900.0 mV 		• 300.0 ms	2 driv- ing cy- cles

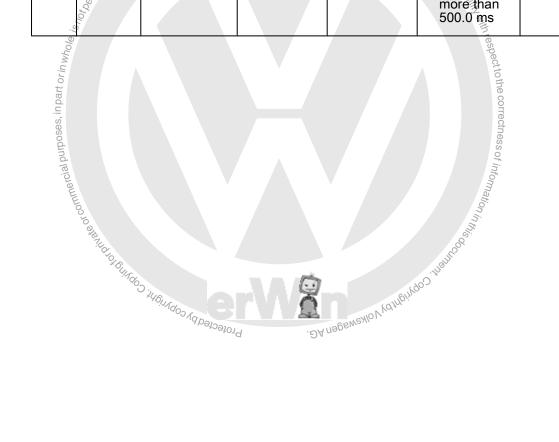
		duniess	DQ-2	50 6F 02E	of Cepy		
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	omercial purposes, in part or in whole	100 to alkalid to 15	 Travel sensor voltage gearshift fork 5/N out of plausibility range Travel sensor voltage gearshift fork 6/R out of plausibility range 		, ingin,	1	
P0702	Trans- mission Control System Electrical	Plausibility check	In spite of cut off cut off common high side switch 1 a measurable current. In spite of turned on common high side switch 1 no current measurable	• CHS1 cut off and CHS1-Current 40 mA CHS1 turned on and CHS1-Current < 200 mA	 One-time after reset Terminal 15 voltage < 18 V No short-circuit current check failure of CHS1 Common high side switch 1 voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 	• 300.0 ms	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
amercial purposes, in part or in whole ;	To by the state of contract of the state of	Provised by Volkswage	In spite of cut off common high side switch 2 a measurable current. In spite of current measurable In spite of current measurable In spite of cut off common high side switch 3 a measurable current. In spite of turned on common high side switch 3 a measurable current. In spite of turned on common high side switch 3 no current measurable In spite of cut off common high side switch 3 no current measurable	CHS2 cut off and CHS2-Current > 40.0 mA CHS2 turned on and CHS2-Current < 200.0 mA CHS3-Current > 40.0 mA CHS3-Current > 200.0 mA CHS3 turned on and CHS3-Current < 200.0 mA	switch 2 voltage > 9.2 V Gearbox subsystem 2 active Common high side switches not deactivated by module 2 One-time after reset Terminal 15 voltage 18.0 V No short-circuit current check failure of CHS3 and		

			DOV	50 6F 02E			400	Ł
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	My liability with
P0717	Input/Tur- bine Shaft Speed Sensor "A" Cir- cuit No Signal	Plausibility check	• Calculate the speed of input shaft 1 with the gear ratio of engaged gear on input shaft speed. compare the calculated speed with measured speed of input shaft 1	(output speed >= 2,000 RPM)	 Valid CAN output speed information Speed of input shaft 1 < 25 RPM Output speed > 25 RPM Terminal 15 voltage > 4 0 		Frequency of checks, MIL Illum • 2 driving cycles	"Of Inthis Ook
			Calculate the speed of input shaft 2 with the gear ratio of engaged gear on input shaft 2 and the output shaft speed. compare the calculated speed with measured speed of input shaft 2		 Gear engaged on input shaft 2 Valid CAN output speed information Speed of input shaft 2 < 25 RPM Output speed > 25 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 			

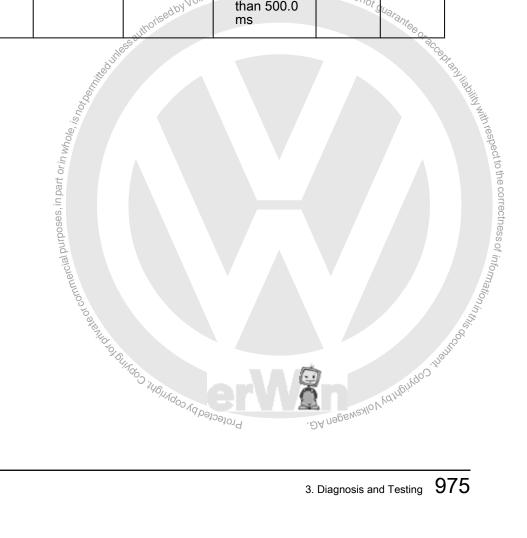
uthorised by Volkswagen AG. Volkswagen AG does not guarantee out

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0729	correct Ratio	Synchronizing detection while the gearshift fork was controlled to engage sixth gear Modised by Volkswager Modised by Volkswag	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safe-	• Integral > 125	 No slipping point adaptation of clutch 2 Multiplexer position = 0 Control gearshift fork valve 3 >= 5% No main pressure loss Terminal 15 voltage > 4.0 	Syn-chron-izing slip, duty factor of safety valve 2	2 driving cycles



		Scarr 1001 - Editio	71 12.2017		Volkswagen AG do		
			DQ-2	50 6F 02E	does no	Ot Sugar	,
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0731	Gear 1 In- correct Ratio	ing detection while the gear-shift fork was controlled to engage 1st gear	that corresponds to the energy flux in the synchronization exceeds a maximum	• Integral > 125	No slipping point adaptation of clutch 1 Multiplexer position = 0 Control gearshift fork valve 1 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms	Syn-chron-izing slip, duty factor of safety valve 1	• 2 driv- ing cy- cles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0732	Gear 2 In- correct Ratio	Synchronizing detection while the gearshift fork was controlled to engage second gear	Integral that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2	Integral > 125 Authorised by Volker Outhorised by Volker O	 No slipping point adaptation of clutch 2 Multiplexer position = 1 Control gearshift fork valve 3>= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed ≥ 600 rpm for more than 500.0 ms 	• Syn-chron-izing slip, duty factor of safety valve 2	• 2 driving cycles



		1	DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0733	Gear 3 Incorrect Ratio	ing detection while the gearshift fork was controlled to engage third gear	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 1	• Integral > 125	 No slipping point adaptation of clutch 1 Multiplexer position = 0 Control gearshift fork valve 2 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• Syn-chron-izing slip, duty factor of safety valve 1	• 2 driving cycles
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			DQ-2	50 6F 02E	Suarante	9	
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0734	correct Ratio	Synchronizing detection while the gearshift fork was controlled to engage fourth gear South of the gear shift fork was controlled to engage fourth gear The gear shift fork was controlled to engage fourth gear shift fork was controlled to engage fourth gear shift for the g	that corresponds to the energy flux in the synchronization exceeds a	• Integral > 125	 No slipping point adaptation of clutch 2 Multiplexer position = 1 Control gearshift fork valve 4 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• Syn-chron-izing slip, duty factor of safety valve 2	2 driving cycles 2 ing cycles 2 ing cy- cles

			DQ-2	50 6F 02E			,
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0735	correct Ratio	ing detection while the gearshift fork was controlled to engage fifth gear	that corresponds to the energy flux in the	• Integral > 125	 No slipping point adaptation of clutch 1 Multiplexer position = 1 Control gearshift fork valve 1 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	Syn-chron-izing slip, duty factor of safety valve 1 Constitution of safety 1	2 driving cycles
P0736	Reverse Incorrect Ratio	Unable to disengage the reverse gear	Gearshift fork of reverse gear stays in shifted position in spite of control to disengage	Gearshift fork position < synchronizing point reverse gear 10% synchronizing point measured by a basic adjustment (reverse gear stays in shifted position) control gear- shift fork	Desired main pressure > 2 bar	6,000.0 ms	

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	or commercial purposes, in part or in whole, is not below.	Synchronizing detection while the gearshift fork was controlled to engage reverse gear The synchronizing detection while the gearshift fork was controlled to engage reverse gear	that corre- sponds to	• Integral > 125	 No slipping point adaptation of clutch 1 Multiplexer position = 0 Control gearshift fork valve 4 > = 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	with respect to the correctness of information in	
P0746	Pressure Control Solenoid "A" Per- for- mance/ Stuck Off	Pressure integral monitoring of the pressure integral monitor	Integral of actual pressure minus de- sired pressure minus drain exceeds a maximum value	• Pressure integral>= 6.1 bar * s	 Desired pressure <= adapted clutch slipping point + 1 bar Standing vehicle with accelerator pedal < 0.1% Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 300.0 ms	• 2 driving cycles

			"mDQ-2	50 6F 02E		arantee o	
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor ing Time Length	Frequen- cy of checks, MIL Illum
		Obeu-cirt check, in part or in who commercial purposes, in part or in who commercial purposes.	Desired valve current of clutch 1 exceeds a threshold simultaneous the actual valve current is smaller than a second threshold	• Desired current> 350.0 mA actual current < 50.0 mA	 Common high side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	, kayubukdoo tu	Illusty with respect to the correctness of information in this occurrence.
P0747	Pressure Control Solenoid "A" Stuck On	Pressure buildup monitoring	The number of successive pressure buildup failure of clutch 1 reaches a maximum value	• Counter > 2	 Engaged gear on input shaft 1 Desired pressure >adapted clutch slipping point – 0.2 bar Output speed < 200 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• 0.0 ms	• 2 driving cycles

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			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	Pilip	Short-circuit current check Short-circuit check Sh	son of actual valve current with desired valve current of clutch 1	Actual current > desired current and (actual current-desired current) > 200.0 mA for more than 200.0 G. Vorinsvagen AGO	high side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500	• 200.0 ms	
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			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0751 Bourposes, inpart or in whole, is not be a solitor of the so	Shift Solenoid "A" Performance/ Stuck Off	• Open-circuit check seadby Volkswagen Ad		common high side 1.0 = 7.0 V) 450.0 mA (sup- ply voltage at common high side 1.0 = 13.0 V)	deactivated by module 2 Change of supply voltage < 10 V Duty factor change of safety valve 1 (control of safety valve 1 is stable) <= 5% Duty factor change of gearshift fork valve 2 (converse to the control of safety valve 2 (converse to the change of gearshift fork valve 2 (converse to the c	• 300.0 ms	• 2 driving cycles

		DQ-2	50 6F 02E			
DTC Fault Code De scription		- 01	Threshold age Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0756 Shift Solenoid "B' Performance/ Stuck Off	cuit check	Comparison of residual current of gearbox subsystem 1 (total current at common high side switch 1 – actual current of clutch 1) at switching point of control gearshift fork valve 2 with residual current at permanent control of control gearshift fork valve 2	1.0 = 13.0 V)	deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 1 (control of safety valve)	• 300.0 ms	• 2 driving cycles

PO761 Shift Sole enoid "C" Performance! Stuck Off Stuck Off				DQ-2	50 6F 02E			
Valve 4 <= 5% (control of gearshift fork valve 4 is stable) • Duty factor of control gearshift fork valve 3 > 70% and steady state time >= 50 ms • Terminal 15	ı	1		l <u> </u>	l	rameters with Enable Condi-	ing Time	Frequen- cy of checks, MIL Illum
voltage > 9.0 V for more than 500.0 ms • Engine speed > 500 RPM	Louin bart or in part or in who,	Shift Sol- enoid "C" Perform- ance/ Stuck Off	Open-circuit check	• Comparison of residual current of gearbox subsystem C2 (total agen current at common high side switch 2 – actual current of clutch 2) at switching point of control gearshift fork valve 3 with residual current at permanent control of control gearshift fork valve 3		high side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem 2 active Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 2 <= 5% (control of safety valve 2 is stable) Duty factor change of gearshift fork valve 4 is stable) Duty factor of control of gearshift fork valve 4 is stable) Duty factor of control gearshift fork valve 4 is stable) Duty factor of control gearshift fork valve 3 > 70% and steady state time >= 50 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500	ms	ing cy-

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0766	enoid "D" Perform- ance/ Stuck Off	Open-circuit check O	2 (total current at common highside switch 2 – actual current of clutch 2) at switching point of control gearshift fork valve 4 with residual current at permanent control of	high side 2.0 = 7.0 V) 450.0 mA (sup- ply voltage at common high side 2.0 = 13.0 V)	 Common high side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem 2 active Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 2 <= 5% (control of safety valve 2 is stable) Duty factor change of gearshift fork valve 3 is stable) Duty factor of control gearshift fork valve 3 is stable) Duty factor of searchift fork valve 3 is stable) Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 300.0 ms	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0771	Shift Solenoid "E" Performance/ Stuck Off	Open-circuit check Pressure in-	part orin whole, is not bearing.	of residual current <= 150.0 mA (maximum of supply voltage at common high side 1,2 and terminal 15 = 7.0 V) 300.0 mA (maximum of supply voltage at common high side 1,2 and terminal 15 = 13.0 V)	Common high side switch 1 and 2 voltage > 9.2 V Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Multiplexerway valve is controlled and steady state time >= 50.0 ms Terminal 15	• 300.0 ms	• 2 driving cycles
	Control Solenoid "B" Per- for- mance/ Stuck Off	tegral moni- toring	actual pressure minus de- sired pres- sure minus drain ex- ceeds a maximum value	integral >= 0,1 bar * s	pressure <= adapted clutch slip- ping point + 1 bar • Standing ve- hicle with ac- celerator pedal < 0.1% • Battery volt- age > 9.0 V for more than 500.0 ms • Engine speed > 500 RPM	. DA nagswey	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0777		Open-circuit check Pressure buildup monitoring	Desired NA Valve current of clutch 2 exceeds a threshold simultaneous the actual valve current is smaller than a second threshold The number of successive pressure buildup failure of clutch 2 reaches a maximum value	• Counter > 2 • Counter > 2 • Counter > 2	high side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem 2 active Common high side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM Engaged gear on input shaft 2 Desired pressure >	$_{\rm xen}$ $_{\rm with respect to the correctness of information in this of the correctness	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0781	1-2 Spirit or in whole, is not or in whole, is not or in whole, is not or in whole is not	Short-circuit current check Unable to disengage the 1st gear Walkedoo Again	Comparison of actual valve with desired valve current of clutch 2 Gearshift fork of 1st gear stays in shifted position in spite of control to disengage Comparison of actual valve with desired valve current of clutch 2	Actual current > desired current - desired current - desired current) > 200.0 mA for more than 200.0 ms Gearshift fork position > synchronizing point 1st gear + 10% synchronizing point we assured by a basic adjustment (1st gear stays in shifted position) control gearshift fork valve 2 >= 5%	high side switch 2 on, not defect and voltage 9.2 V Gearbox subsystem 2 active Common high side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM	• 200.0 ms • 6,000.0 ms	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0782	2-3 Shift	Unable to disengage the second gear	Gearshift fork of second gear stays in shifted position in spite of control to disengage	Gearshift fork position < synchronizing point second gear - 10% synchronizing point measured by a basic adjustment (second gear stays in shifted position) control gearshift fork valve 4 >= 5%	 Control safety valve 1 (ON) >= 20% Multiplexer position = 1 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms 	• 6,000.0 ms	• 2 driving cycles
		s authorised h	_N Volkswagen AG. V	olkswagen AG does	• Engine speed > 600 RPM for more than 500.0 ms		
P0783	3-4 Shift	Unable to disengage the third gear	Gearshift fork of third gear stays in shifted position in spite of control to disengage	Gearshift fork position < synchronizing point third gear - 10% synchronizing point measured by a basic adjust- ment (third gear stays in shifted position) control gearshift fork valve 1 >= 5%	 Control safety valve 1 (ON) >= 20% Multiplexer position = 0 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	_{sct} to the correctness of information in this c	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0784	4-5 Shift	Unable to disengage the fourth gear Output Discontinue of the search of the se	Gearshift fork of fourth gear stays in shifted position in spite of AG control to disengage	Gearshift fork position > synchronizing point fourth gear 10% synchronizing point measured by a basic adjustment (fourth gear stays in shifted position) control gearshift fork valve 3 >= 5%	• No main pressure > 2 bar pressure > 2 bar pressure 2	s s	2 driving cycles
P0791	Inter- mediate Shaft Speed Sensor "A" Cir- cuit	Signal grange check	 Rotational speed of input shaft 1 exceed a maximum value Or Rotational speed of input shaft 2 exceed a maximum value 	• Rotational speed > 12,000 RPM	Terminal 15 voltage > 4.0 V for more than 500.0 ms NSHONALIPATO NSHON	• 100.0 ms	• 2 driv- ing cy- cles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0797	Pressure Control Solenoid "C" Stuck On	Short-circuit current check	son of actual valve current with desired valve current of main pressure solenoid valve	Actual current>desired current and (actual current- desired current) > 200.0 mA for more than 300.0 ms Gearshift Gearshift	 switch 3 on and not defect Common high side switch 1 and 2 voltage > 9.2 V Common high side 	• 300.0 ms	• 2 driving cycles
P0829	5-6 Shift	Unable to disengage the fifth gear	fork of fifth gear stays in shifted position in spite of control to disengage	fork position > synchronizing point fifth gear + 10% synchronizing	 Control safety valve 1 (ON) >= 20% Multiplexer position = 1 Desired main pressure > 2 bar No main pressure 	• 6,000.0 ms	

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			DQ-2	50 6F 02E			O BCC
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Unable to disengage the sixth gear	Gearshift fork of sixth gear stays in shifted position in spite of control to disengage	• Gearshift fork position > synchronizing point sixth gear + 10% synchronizing point measured by a basic adjustment (sixth gear stays in shifted position) control gearshift fork valve 4 >= 5%	 Control safety valve 2 (ON) >= 20% Multiplexer position = 0 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 Veroll for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 		Quanto Ophianio
P0840	Trans- mission Fluid Pressure Sensor/ Switch "A" Cir- cuit	Signal range check	Pressure sensor voltage clutch 1 out of plau- sibility range	 Voltage < 100.0 mV Or Voltage > 4,900.0 mV 		• 300.0 ms	2 driv- ing cy- cles
P0841	Trans- mission Fluid Pressure Sensor/ Switch "A" Cir- cuit Range/ Perform- ance	Overpressure monitoring	Hydraulic pressure of clutch 1 exceeds a maximum value	• Pressure >= 15.5 bar	 Signal range check is correct Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 1,000.0 ms	• 2 driv- ing cy- cles

	DQ-250 6F 02E									
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum			
P0845	Trans- mission Fluid Pressure Sensor/ Switch "B" Cir- cuit	Pressure sensor volt- age clutch 2 out of plau- sibility range	Pressure sensor voltage clutch out of plau- sibility range	 Voltage < Wag 100.0 mV Or Voltage > 4,900.0 mV 	tions agen AG does not guara	• 300.0 ms	• 2 driv- ing cy- cles			
P0846	Trans- mission Fluid Pressure Sensor/ Switch "B" Cir- cuit Range/ Perform- ance	Overbread purposes, in part or in whole, some wont to single services and part or in whole services are more than the services are more than the services are more than the services are the services and the services are the	Hydraulic pressure of clutch 2 exceeds a maximum value	• Pressure >= 15.5 bar	 Signal range check is correct Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 80.0 ms	2 in ges ctto the correctness of information in			
P0864	TCM Commu- nication Circuit Range/ Perform- ance	Buss off de- tection of	BUILDO WEUNDOONDE	BLW Brotecte	Terminal 15 voltage > 9.0 V for more than 500.0 ms > 500.0 ms after reset Terminal 15	• 1,000.6 ms Judging	2 driv- ing cy- cles			
P0890	TCM Power Relay Sense Circuit Low	Short-circuit current check	Detection by hard- ware cir- cuit	• Current > 8.5 A	Terminal 15 voltage > 4.0 V for more than 500.0 ms	• 200.0 ms	2 driv- ing cy- cles			

				50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0914	Gear Shift Po- sition Cir- cuit	Time out detection of the ques- tion and an- swer diag- nosis	If time out of the question and answer diagnosis is detected increment an event counter	• Time out threshold > 100.0 ms	Gear message for selector lever is transmittable and selector lever message is refolks of ceivable No failure of selector lever CAN messages Time after reset > 100.0 ms Terminal 15 voltage > 4.0 V for more than 500.0 ms No bus off error No error failure of all CAN messages No failure of selector lever CAN messages Time after reset > 1,100.0 ms	• 300.0 ms	• 2 driving cycles
			inpart or in whole, is not better		set > 100.0 ms Terminal 15 voltage > 4.0 V for more than 500.0 ms		
		Plausibility check of se- lector lever	Selector lever position is not equal to negation of the inverse selector lever position Or	or position 3 or posi- tion 4 or position L	 No bus off error No error failure of all CAN messages No failure of selector lever CAN messages 	• 1,000.0 ms	
			 Selector lever position equals initialization value Or Selector lever position equals error value 	"AGOS 74611AGOS	er CAN messages Time after reset > 1,100.0 ms Terminal 15 voltage > 9.0 V for more than 1,100.0 ms	. ĐA nagası	_{гемо Колейи}
			 Or Selector lever position is equal to negation of the inverse selector lever position but no valid position 				

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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	part or in whole, is	Question and answer diagnosis	Failure of question and an- swer diag- nosis			1,500.0 ms	
P0919	Gear Shift Po- sition Control Error	• Validity	If the se-	Olkswagen AG.	 No failure of selector lever CAN messages Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM No failure of 	• 20.0 ms	2 driv- ing cy- cles
		check of se- lector lever position	lector lever position is equal to negation of the inverse selector lever position but is not valid (position = L, P4, P3, P2, or P1)		selector lev- er CAN mes- sages • Terminal 15 voltage > 4.0 V for more than 500.0 ms		
			Is not in error state (position != error)				
			And Initialization value with the initialization flag not set then increment an event counter				

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Error detection of the question and answer diagnosis	swer of the diagnosis is wrong an event counter is incremen- ted	agen AG does not go	 No failure of selector lev- er CAN mes- sages Terminal 15 voltage > 4.0 V for more than 500.0 ms 	• 100.0 ms	
	of commercial purposes, in part or in whole, is horberning,	Plausibility check of se-	 If the selector lever position is not equal to negation of the inverse selector lever position Or Selector lever position equals initialization value but the initialization flag is not set Or Selector lever position equals initialization value but the initialization flag is not set Or Selector lever position equals initialization flag is not set 	DA Naganaklo V.	 No failure of selector lever CAN messages Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	400.0 ms tespect to the correctness of Information	
P0929	Gear Shift Lock Solenoid/ Actuator Control Circuit "A" Range/ Perform- ance	v anaity	If the shift lock position signal is not valid (position!= error, deactive, active or init) increment an event counter		 No failure of selector lev- er CAN mes- sages Terminal 15 voltage > 4.0 V for more than 500.0 ms 	• 20.0 ms	2 driv- ing cy- cles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2711	Unexpected Mechanical Gear Disengagement	engage a gear on shaft 1 • Unable to engage a gear on shaft	engage- ments of the same gear on shaft 1 exceeds a maximum value • The num- ber of successive engage- ments of the same gear on shaft 2 exceeds a maximum value		Battery volt- kswage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms	• 0.0 ms	• 2 driving some content to the correctness of information in this country in the coun
		engage- ment of	gear dis- engage- ment counter exceeds a	• Counter > 3	Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms Output	VOTHETHOOD JUSE	tion in this cooking
		Detect dis- engage- ment of gears on shaft 2 with- out control	In spite of a constant desired gear dis- engage- ment counter exceeds a maximum value		speed >= 12 RPM		

			DQ-2	50 6F 02E				
Cod	ault de De- ription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	
Sole "E" for- mar	ntrol enoid Per-	Open-cir- cuit check	whole, is n		 Common high side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor of control gearshift fork valve 1 and 2 <= 10% Duty factor of safety valve and steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 300.0 ms	• 2 driving cycles	28 of acceptany liability with respect t
			or commercial purposes, in part	Separator of the state of the s	Protected by co	. ĐA nag	Bewsylo V V V V V V V V V V V V V V V V V V V	acceptany liability with respect to the correctness of information in this occurrence of the correctness of the corre

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2732	Pressure Control Solenoid "F" Per- for- mance/ Stuck Off	Open-cir- cuit check	Residual current of gearbox subsystem 2 (total current at common high side switch 2 – actual current of clutch 2) is smaller than a minimum value	• Residual current <= 150.0 mA (supply voltage at common high side 2 = 7.0 V) 300.0 mA (supply voltage at common high side 2 = 13.0 V)	 Common high side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem 2 active Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor of control gearshift fork valve 3 and <= 10% Duty factor of safety valve 2 >= 53% and steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 		• 2 driving cycles

Transmission Control Module , 6 speed 02E (2016 MY) 3.5.2

			thole, is not bern,		• Engine speed > 500 RPM			mility with respect to the
3.5.2	Tran	smission Co	S.	e , 6 speed	02E (2016 MY)	4	ot to the consciness
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	ess of information in t
P0219	Engine Over- speed Condition	Signal range check	Rotational speed of gearbox input shaft exceed a maximum value	• Rotational speed > 12,000 RPM	Terminal 15 voltage > 4.0 V for more than 500.0 ms	, The	• 2 driv- ing cy- cles	5.
				idected by copyright.	DANG.	POLKSWAY		

				50 6F 02E			l _
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0501	Vehicle Speed Sensor "A" Cir- cuit Range/ Perform- ance	Plausibility check	Calculate the speed of input shaft with the gear ratio of engaged gear on input shaft and the output shaft speed. compare the calculated speed with measured speed of input shaft	• Speed difference magnitude > 330 RPM (output speed = 500 RPM) - 100 RPM (output speed >= 2,000 RPM)	No valid CAN output speed information	• 300.0 ms	2 driving cycles
P0701	Trans- mission Control System Range/ Perform- ance	Signal range check S	range	 Voltage < 300.0 mV Or Voltage > 4,700.0 mV 	JIKEWASGEN AG.	\$U _a ,300.0 ms _a	2 driving cycles Other distribution of the control of the cycles Other distribution of the cycles Ot
			THOUS THOUSAND	o _{Aqpeloelou}	IKANSOBILI CO	V. Copyight by V.	Į.

DQ-250 6F 02E								
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions AGdo	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	
			sensor voltage gearshift fork 6/R out of plau- sibility range			Suarant _e	MIL Illum	
P0/02	Trans- mission Control System Electrical	• Plausibility check	switch 1 a measurable current. In spite of turned on common high side switch 1 no current	• CHS1 cut off and CHS1-Current > 40.0 mA CHS1 turned on and CHS1-Current < 200.0 mA	 One-time after reset Terminal 15 voltage < 18.0 V No short-circuit current check failure of CHS1 Common high side switch 1 voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 	· 300.0 ms	2 driving cycles	
			 In spite of cut off common high side switch 2 a measurable current. In spite of turned on common high side switch 2 no current measurable. 	CHS2 cut off and CHS2-Current > 40.0 mA CHS2 turned on and CHS2-Current < 200.0 mA	 One-time after reset Terminal 15 voltage < 18.0 V No short-circuit current check failure of CHS2 Common high side switch 2 voltage > 9.2V Gearbox subsystem 2 active Common high side switches not deactivated by module 2 			

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OTC Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		In spite of cut off cout off common high side switch 3 a measurable current. In spite of turned on common high side switch 3 no current measurable.	CHS3 cut off and CHS3-Curred > 40.0 mA CHS3 turned on and CHS3-Current < 200.0 mA CHS3-Current < 200.0 mA	One-time after reset Terminal 15 voltage < 18.0 V No short-circuit current check failure of CHS3 and main pressure solenoid valve Common high side voltage > 9.2 V Common high side switches not deactivated by module 2	swagen AG do	^{9S} not guarante
Input/Turbine Shaft Speed Sensor "A" Circuit No Signal	Plausibility check	• Calculate the speed of input shaft 1 with the gear ratio of engaged gear on input shaft 1 and the output shaft speed. Compare the calculate	ference magnitude > 330 RPM (output speed = 500 RPM) - 100 RPM (output speed >= 2,000 RPM)	 Gear engaged on input shaft 1 Valid CAN output speed information Speed of input shaft 1 < 25 RPM Output speed > 25 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• 900.0 ms	2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0729	Gear or in part or in whole, is not be sent or in which it is not be sent or in which it is not be sent or in which it is not be sent or in which	Synchroniz-	Calculate the speed of input shaft 2 with the gear ratio of engaged gear on input shaft 2 and the output shaft speed. Compare the calculated speed with measured speed of input shaft 2. Integral	• Integral >	 Gear engaged on input shaft 2 Valid CAN output speed information Speed of input shaft 2 < 25 RPM Output speed > 25 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms No slipping 	• Syn-	• 2 driv-
P0729	Gear 6 In± correct Ratio	ing detection while the gearshift fork was controlled to engage sixth gear	• Integral that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2.	125	point adapta- tion of clutch	• Syn- chron- izing slip, duty factor of safety valve 2	• 2 driv- ing cy- cles

DQ-250 6F 02E							
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0731	Gear 1 In- correct Ratio	Synchronizing detection while the gearshift fork was controlled to engage first gear	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor	• Integral > 125	 No slipping point adaptation of clutch 1 Multiplexer position = 0 Control gearshift fork valve 1 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	izing slip, duty factor of safety valve 1	• 2 driving cycles
		or commercial purposes, in part or in whole, is no	Ado iyoji Maloo Maloo iyo	Seloto Id	DA nagswexllo V Vantor	Ago Tikeling of the Ago Ti	with respect to the correctness of information in a

	,			50 6F 02E			
DTC	Fault Code De- scription	Monitor Strategy Description	Criteria	^{∨∘} Threshold ⊲o Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	Gear 2 Incorrect Ratio	Synchronizing detection while the gearshift fork was controlled to engage second gear	that corresponds to the energy flux in the	• Integral > 125	 No slipping point adaptation of clutch 2 Multiplexer position = 1 Control gearshift fork valve 3 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine Speed > 600 RPM for more than 500.0 ms 	izing slip, duty factor of safety valve 2	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0733 Millian Darkovital part of the post of the post of the part of the post	correct Ratio	• Synchronizing detection while the gearshift fork was controlled to engage third gear	Integral that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 1.	• Integral > 2 125	 No slipping point adaptation of clutch Multiplexer position = 0 Control gearshift fork valve 2 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	Syn-chron-izing slip, duty factor of safety valve 1	2 driving cycles

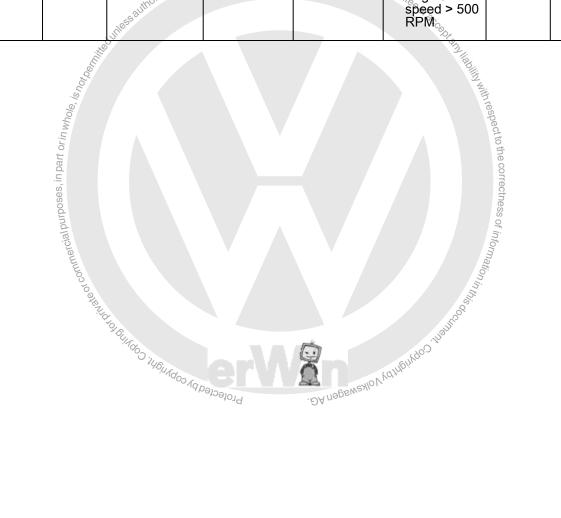
			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0734	correct Ratio	Synchronizing detection while the gearshift fork was controlled to engage fourth gear Milliant Controlled to engage fourth gear Synchronizing detection while the gearshift fork was controlled to engage fourth gear The synchronizing detection while the gearshift fork was controlled to engage fourth gear The synchronizing detection while the gearshift fork was controlled to engage fourth gearshift for the gearsh	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral agen	• Integral > 125	 No slipping point adaptation of clutch 2 Multiplexer position = 1 Control gearshift fork valve 4 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	Strandlian lith with respect to	the Correctness of :
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			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0735	Gear 5 In- correct Ratio	Synchronizing detection while the gearshift fork was controlled to engage fifth gear Alega and the standard stand	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 1.	• Integral > 125	 No slipping point adaptation of clutch 1 Multiplexer position = 1 Control gearshift fork valve 1 >= 5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 	Syn-chron-izing slip, duty factor of safety valve 1	• 2 driv- ing cy- cles
	Reverse Incorrect		 Gearshift fork of re- verse gear 	Gearshift fork position < synchronizing point reverse gear - 10% synchronizing point measured by a basic adjustment (reverse gear stays in shifted position) Control gearshift fork valve 3 >= 5% One of the control gearshift fork valve 3 >= 5% One of the control gearshift fork valve 3 >= 5% One of the control gearshift fork valve 3 >= 5% One of the control gearshift fork valve 3 >= 5%	 Control safety valve 2 (on) >= 20% Multiplexer position = 0 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine 	6,000.0 ms Conect to the correctness of inform	9• 2 driv- ing cy- cles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Synchronizing detection while the gearshift fork was controlled to engage reverse gear	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral agen	• Integral > 125	 No slipping point adaptation of clutch 1 Multiplexer position = 0 Control gearshift fork valve 4 >= 100.5% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	Syn-chron-izing slip, duty factor of safety valve 1	the corrections of
P0746	Pressure Control Solenoid "A" Per- for- mance/ Stuck Off	Pressure integral monitoring	Integral of actual pressure minus desired pressure minus drain exceeds a maximum value properties of the control of the contr	• Pressure integral >= 0.1 bar * s	 Desired pressure <= adapted clutch slipping point + 1 bar Standing vehicle with accelerator pedal < 0.1% Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 300 ms in this country is	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value Nolkswagen AG. V	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0747	Pressure Control Solenoid "A" Stuck On	Open-circuit check Pressure buildup monitoring	Desired valve current of clutch 1 exceeds a threshold simultaneous the actual valve current is smaller than a second threshold The number of successive pressure buildup failure of clutch 1 reaches a maximum value	• Desired current > 350.0 mA • Actual current < 50.0 mA	Common high side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM Engaged gear on input shaft 1 Desired personner > adapted clutch slipping point - 0.2 bar Output speed < 200 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms		Stemy liability with respect to the state of

	,		DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Short-circuit current check	Comparison of actual valve current with desired valve current of clutch 1	Actual current > desired current and (actual current - desired current) > 200.0 mA for more than 200.0 ms	 Common high side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 	• 200.0 ms	
		unlass autorised by Voll	_{ssw} agen AG. Volksv	/agen AG does not g	Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM		



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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	Shift Sol-enoid "A" Perform Part or in who of is a post of the part of the par	• Open-circuit check	Comparison of residual current of gearbox subsystem 1 (total current at common high side switch 1 – actual current of clutch 1) at switching point of control gearshift fork valve 1 with residual current at permanent control of gearshift fork valve 1	Difference of residual current <= 200.0 mA (supply voltage at common high side 1 = 7.0 V) - 450.0 mA (supply voltage at common high side 1 = 13.0 V) Gen AG does not gua	 Common high side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 1 (control of safety valve 1 is stable) = 5% Duty factor change of gears hift fork valve 2 is stable) <= 5% Duty factor change of gears hift fork valve 2 is stable) <= 5% Duty factor of control gearshift fork valve 2 is stable) <= 5% Duty factor of control gearshift fork valve 2 is stable) <= 5% Terminal 15 voltage > 90 V for more than 500 0 ms Engine speed > 500 RPM 	• 300.0 ms	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0756	enoid "B" Perform- ance/ Stuck Off	• Open-circummercial purposes, in part or in whole, is not being the control of t	Comparison of residual current of gearbox subsystem 1 (total current at common high side switch 1 – actual current of clutch 1) at switching point of control gearshift fork valve 2 with residual current at permanent control of control gearshift fork valve 2 authorised by Volksward	Difference of residual current <= 200.0 mA (supply voltage at common high side 1 = 7.0 V) – 450.0 mA (supply voltage at common high side 1 = 13.0 V) Agen AG. Volkswage	Common high side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 1 (control of safety valve 1 is stable) <= 5% Duty factor change of gearshift fork valve 1 (control of gearshift fork valve 1 is stable) <= 5% Duty factor of control gearshift fork valve 2 > 70% And steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM	CONTRAIN_	2 driving cycles
		TOO TO SHAMING TO SOLIT	(400 jugs		in the second	doo jialingo ji	Fig. 1.
			Ched by COPyne.	old .	3. Di	agnosis and l	Γesting 10

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0761	enoid "C" Performance/ Stuck Off	• Open-circuit check	Comparison of residual current of gearbox subsystem 2 (total current at common high side switch 2 – actual current of clutch 2) at switching point of control gearshift fork valve 3 with residual current at permanent control of control gearshift fork valve 3	$= 13.0 \text{ V}$ $n_{AG} d_{Oes} n_{Ot} g_{U_{Oes}}$	 age < 1.0 V Duty factor change of safety valve 2 (control of safety valve 2 is stable) <= 5% Duty factor change of gearshift fork valve 4 (control of gearshift fork valve 4 is stable) <= 5% Duty factor of control gearshift fork valve 3 > 70% And steady state time >= 50.0 ms 	• 300.0 ms	• 2 driving cycles

P0766 Shift Sole enoid "D" enoid "D" enoid "D" enter of cuit check Stuck Off				DQ-2	50 6F 02E			
Performance/ Stuck Off Cuit check Stuck Off Stuck Off Common high side Switch 2 on, not defect and voltage at common high side Switch 2 on, not defect Switch 2 on, not de	DTC	Code De-	egy Descrip-			rameters with Enable Condi-	ing Time	Frequen- cy of checks, MIL Illum
• Engine speed > 500 RPM INDIVIDUADO NATURAL PROPERTY OF THE P		enoid "D" Performance/ Stuck Office of in whole, is not not in whole, is not not in whole, is not	cuit check	son of residual current of gearbox subsystem 2 (total current at common high side switch 2 – actual current of clutch 2) at switching point of control gearshift fork valve 4 with residual current at permanent control of control gearshiftok valve 4	of residual current <= 200.0 mA (supply voltage at common high side 2 = 7.0 V) – 450.0 mA (supply voltage at common high side 2 = 13.0 V)	high side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem 2 active Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 2 (control of safety valve 2 is stable) <= 5% Duty factor change of gearshift fork valve 3 (control of gearshift fork valve 3 is stable) <= 5% Duty factor of control gearshift fork valve 3 is stable) <= 5% Duty factor of control gearshift fork valve 4 > 70% And steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM	ms ms ms ms pect to the correctness of information	ing cy-

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	Shift Solenoid "E" Performance/ Stuck Off	Open-cir- cuit check	Comparison of residual current of central control (total current at common high side switch 3 – actual current of main pressure valve and cooling oil valve) at switching point of multiplexer valve with residual current at permanent control of multiplexer valve.	high side 1, 2 and terminal 15 = 13.0 V)	 Common high side switch 3 on and not defect No short-circuit current check failure of main pressure solemoid valve Common high side switch 1 and 2 voltage > 9.2 V Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Multiplexer valve is controlled And steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 300.0 ms	nugurdo jugi

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	Pressure Control Solenoid "B" Performance/ Stuck Office S	Pressure integral monitoring Open-circuit check Adding of the paper of	actual pressure G. minus de4g sired pres-	Pressure integral >= 0.1 bar * s Ooes not guarantee of the current > 350.0 mA Actual current < 50.0 mA Actual current < 50.0 mA	hicle with accelerator pedal < 0.1% Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM Common high side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem 2 active Common	• 300.0 ms	• 2 driving cycles

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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0777	Pressure Control Solenoid "B" Stuck On	Pressure buildup monitoring	The number of successive pressure buildup failure of clutch 2 reaches a maximum value	• Counter > 2	 Engaged gear on input shaft 2 Desired pressure > adapted clutch slipping point - 0.2 bar Output speed < 200 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms 	• 0.0 ms	ing cy- cles
				es sautrorise	Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms	olkswagen A _C	does not guar
		Short-circuit current check	son of actual valve current with descurrent of current of clutch 2	• Actual cur- rent > de- sired cur- rent and (actual current - desired current) >	 Common high side switch 2 on, not defect and voltage > 9.2 V Gearbox 	• 200.0 ms	
			POTTER	200.0 mA for more than 200.0 ms	Ierminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM	SAn:	acews Moving Mayor

			DQ-2	50 6F 02E		
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time cy of Length checks, MIL Illum
P0781	1-2 Shift	Unable to disengage the first gear	Gearshift fork of first gear stays in shifted position in spite of control to disengage	 Gearshift fork position > synchronizing point first gear + 10% synchronizing point measured by a basic adjustment (first gear stays in shifted position) Control gearshift fork valve 2 >= 5% 	 Control safety valve 1 (on) >= 20% Multiplexer position = 0 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• 6,000.0 • 2 driving cycles
P0782	2-3 Shift	Unable to disengage the second gear Mayor or in mart or in whole, is not in mark or in mark o	Gearshift fork of second gear stays in shifted position in spite of control to disengage Although Al	Gearshift fork posi- tion < syn- chronizing point sec-	 Control safe⁴ ty valve 1 (on) >= 20% Multiplexer 	6,000.0 2 driving cycles 1 and the constraint of information in t

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria Criteria	Threshold Value Volkswagen AG do	Secondary Parameters with Enable Condi-	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0783		Unable to disengage the third gear Unable to disengage the fourth	Gearshift fork of third gear stays in shifted position in spite of control to disengage Google Base Google Base	Gearshift fork position < synchronizing point third gear - 10% synchronizing point measured by a basic adjustment (third gear stays in shifted position) Control gearshift fork valve 1 >= 5%	 Control safety valve 1 (on) >= 20% Multiplexer position = 0 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• 6,000.0 ms And liability with respect to the correctness of information in this or on the correctness of information in this or on the correctness of information in this or on the correctness of information in this or	• 2 driving cycles
P0784	4-5 Shift	Unable to disengage the fourth gear	Gearshift fork of fourth gear stays in shifted position in spite of control to disengage	Gearshift fork position > synchronizing point fourth gear + 10% synchronizing point measured by a basic adjustment (fourth gear stays in shifted position) Control gearshift fork valve 3 >= 5%		• 6,000.0 ms	• 2 driv- ing cy- cles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0791		Signal range check	Rotational speed of input shaft 1 exceed a maximum value Rotational speed of input shaft 2 exceed a maximum value	Rotationals, speed > 12,000 RPM	Terminal 15 voltage > 4.0 V for more than 500.0 ms	• 100.0 ms	• 2 driving cycles
P0797	Control Solenoid "C" Stuck On	current	son of actual valve current with desired valve current of main pressure sole-	Actual current > desired current and (actual current - desired current) > 200.0 mA for more than 300.0 ms	 Common high side switch 3 on and not defect Common high side switch 1 and 2 voltage > 9.2 V Common high side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 300.0 ms ectness of information in this	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	5-6 Shift	 Unable to disengage the fifth gear Unable to disengage the sixth gear 	Gearshift fork of fifth gear stays in shifted position in spite of control to disengage G. Volkswagen AG	Gearshift fork position > synchronizing point fifth gear + 10% synchronizing point measured by a basic adjustment (fifth gear stays in shifted position) Control gearshift fork valve 2 >= 5%	 Control safety valve 1 (on) >= 20% Multiplexer position = 1 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 	• 6,000.0 ms	2 driving cycles
or commercial purposes, in part or in who	Stealing to Blink to S.	• Unable to disengage the sixth gear	Gearshift fork of sixth gear stays in shifted position in spite of control to disengage Sylva	gear stays in shifted position)	pressure		

				50 6F 02E	1	1	
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0840	Trans- mission Fluid Pressure Sensor/ Switch "A" Cir- cuit	Signal range check	Pressure sensor voltage clutch 1 out of plau- sibility range	 Voltage < 100.0 mV Or Voltage > 4,900.0 mV 		• 300.0 ms	2 driv- ing cy- cles
P0841	Trans- mission Fluid Pressure Sensor/ Switch "A" Cir- cuit Range/ Perform- ance	Overpressure monitoring AG. Volks	Hydraulic pressure of clutch 1 exceeds a maximum value wagen AG does a	• Pressure >= 15.5 bar	 Signal range check is correct Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 1,000.0 ms	• 2 driv- ing cy- cles
P0845	Transmission Fluid Pressure Sensor/ Switch "B" Circuit	Signal range check	Pressure sensor voltage clutch 2 out of plausibility range	• Voltage < 100.0 mV • Or • Voltage > 4,900.0 mV		• 300.0 ms	• 2 driv- ing cy- cles
P0846	Trans- mission Fluid Pressure Sensor/ Switch "B" Cir- cuit Range/ Perform- ance	Overpressure monitoring	Hydraulic pressure of clutch 2 exceeds a maximum value	• Pressure >= 15.5 bar	 Signal range check is correct Terminal 15 voltage > 4.0 V for more than 500.0 ns Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	ms	• 2 driv- ing cy- cles
P0864	Commu- nication	• Buss off detection of the micro controller	.DA nagewaylo	Walleringo jrgm	 Terminal 15 voltage > 9.0 V for more than 500.0 ms > 500.0 ms after reset 	• 80.0 ms	2 driv- ing cy- cles

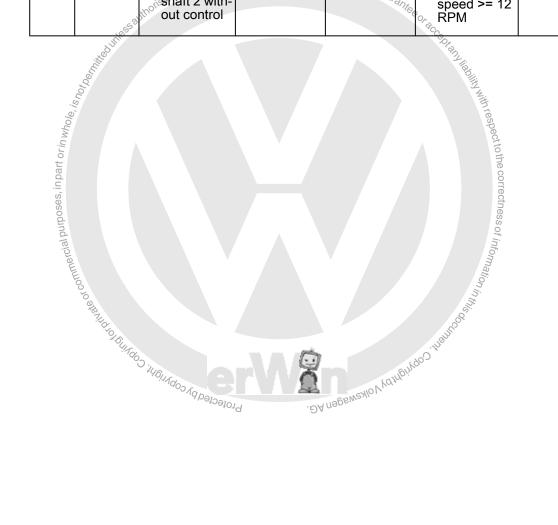
			DQ-2	50 6F 02E			,
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0890	TCM Power Relay Sense Circuit Low	Short-circuit current check	Detection by hard- ware cir- cuit	• Current > 8.5 A	Terminal 15 voltage > 4.0 V for more than 500.0 ms G. Volkswag	• 200.0 ms	• 2 driv- ing cy- cles
P0914	Gear Shift Po- sition Cir- cuit	Time out detection of the ques- tion and an- swer diag- nosis	If time out of the question and answer diagnosis is detected increment	• Time out threshold > 100.0 ms	 Gear mes- sage for se- lector lever is transmittable and selector lever mes- sage is re- ceivable 	• 300.0 ms	• 2 driv- ing cy- cles
			an event counter		 No failure of selector lev- er CAN mes- sages 		
			poses, in p		• Time after Reset > 100.0 ms		
			or commercial pur	i Bundos iubinados na po	 Terminal 15 voltage > 4.0 V for more than 500.0 ms 		

			DQ-25	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Plausibility check of selector lever Question and answer diagnosis	Selector lever position is not equal to negation of the inverse selector lever position equals initialization value Or Selector lever position equals initialization value Or Selector lever position equals error value Or Selector lever position is equal to negation of the inverse selector lever position but no valid position but no valid position was and answer diagnosis	Selector lever position = Position 1 or Position 2 or Position 3 or Position 4 or Position L	 No bus off error No error failure of all CAN messages No failure of selector lever CAN messages Time after reset > 1,100.0 ms Terminal 15 voltage > 9.0 V for more than 1,100.0 ms 	es not guarante	* Oraccaptan like
P0919	Gear Shift Po- sition Control Error	Evaluation the error signal of sell lector lever CAN message	of not de-	Protected by copyrig	 No failure of selector lever CAN messages Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 20.0 ms	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	. commercial purposes, in part or in whole, is not.	Validity check of selector lever position Error detection of the question and answer diagnosis American diagnosis The detection of the question and answer diagnosis The detection of the detection and answer diagnosis	If the selector lever position is equal to negation of the inverse selector lever position but is not valid (position = L. P4. P3. P2, or P1) And Is not in error state (position! = error) And Equals not the initialization value with the initialization flag not set Then increment an event counter If the answer of the diagnosis is wrong an event counter is incremented		No failure of selector lever CAN messages Terminal 15 voltage > 4.0 V for more than 500.0 ms Not guarante of selector lever CAN messages Terminal 15 voltage > 4.0 V for more than 500.0 ms	with respect to the correctness of information in the spect to th	

			uagen AG. Vo	olkswagen AG do	G	eneric Scan Tool	- Edition 12	2.2017
		orised!	by Volkswagen Ald. Vo	DO-2	50 6F 02E			
	DTC	Fault Code De-	Monitor Strat- egy Descrip-	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
ecial purposes, in part or in when	of commerce of commerce of commerce of sold sold sold sold sold sold sold sold	J. B.L. A. B. J.	• Plausibility check of selector lever position	 If the selector lever position is not equal to negation of the inverse selector lever position Or Selector lever position equals initialization value but the initialization flag is not set Or Selector lever position equals initialization flag is not set Or Selector lever position equals error value then increment an event counter 	NO V VENTO PIONE	No failure of selector lever CAN messages Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Fingine speed > 500 RPM	• 400.0 ms	
	P0929	Gear Shift Lock Solenoid/ Actuator Control Circuit "A" Range/ Perform- ance	Validity check of shift lock position sig- nal	If the shift lock position signal is not valid (position! = error, deactive, active or init) increment an event counter If the shift lock position is not valid (position! = error, deactive, active or init) increment an event counter		 No failure of selector lev- er CAN mes- sages Terminal 15 voltage > 4.0 V for more than 500.0 ms 	• 20.0 ms	• 2 driv- ing cy- cles
	P2711	Unexpec- ted Me- chanical Gear Dis- engage- ment	Unable to engage a gear on shaft 1	The number of successive engagements of the same gear on shaft 1 exceeds a maximum value	• Counter >= 6	Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms	• 0.0 ms	• 2 driv- ing cy- cles

	DQ-250 6F 02E									
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum			
		Unable to engage a gear on shaft 2	The number of successive engagements of the same gear on shaft 2 exceeds a maximum value							
		Detect disengagement of gears on shaft 1 without control Detect disengagement of gears on shaft 2 without control	a constant desired gear dis- engage- ment counter exceeds a maximum	• Counter > 3	 Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms Output speed >= 12 RPM 					



				risedus			Warang.
			DQ-2	50.6F 02E			"Antegor
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2723	Pressure Control Solenoid "E" Per- for- mance/ Stuck Off	Open-cir- cuit check	Residual current of gearbox subsystem (total current at common high side switch 1 – actual current of clutch 1) is smaller than a minimum value	• Residual current <= 150.0 mA (supply voltage at common high side 1 = 7.0 V) - 300.0 mA (supply voltage at common high side 1 = 13.0 V)	Common high side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor of control gearshift fork Valve 1 and 2 <= 10% Duty factor of safety valve 1 >= 53% And steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM	A nagawaylov wa	• 2 driving cycles

DTC	Fault	Monitor Stret	Malfunction	50 6F 02E	Secondary Do	Monitor	Erecues
טוט	Code De- scription	Monitor Strat- egy Descrip- tion	Maifunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2732	Pressure Control Solenoid "F" Per- for- mance/ Stuck Off	Open-cir- cuit check	Residual current of gearbox subsystem 2 (total current at common high side	• Residual current <= 150.0 mA (supply voltage at common high side 2 = 7.0 V) –	 Gearbox 	• 300.0 ms	• 2 driv- ing cy- cles
			switch 2 – actual cur-	300.0 mA (supply	subsystem 2 active		
			rent of clutch 2) is smaller than a min- imum val- ue	voltage at common high side 2 = 13.0 V)	 Common high side switches not deactivated by module 2 		
			ue		 Change of supply volt- age < 1.0 V 		
				unless authorised by Vo	age < 1.0 V Duty factor of control gearshift fork valve 3 and 4 <= 10%	gen AG does /	ot gu _{arantee} o,
				inis	Duty factor of safety valve 2 >= 53%		
			hole, isho _t b		 And steady state time >= 50.0 ms 		
			inercial purposes, in part or in whole, is not be miles.		 Terminal 15 voltage > 9.0 V for more than 500.0 ms 		
			roial purpos		• Engine speed > 500 RPM		
U010 0	Lost Commu- nication	Message time-out de- tection	Failure of all CAN engine	Time-out for more than 490.0	No bus off er- ror	• 490.0 ms	2 driv- ing cy- cles
	With ECM/ PCM "A"		messages	ms	 No error failure of all CAN messages 		
				14611Xd00Xq	ure of all CAN mes- sages Terminal 15 voltage > 9.0 of of or more than 500.0 ms	. DA nagenve.	YO V VO THEY THE
					• > 500.0 ms after reset		

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strategy Description	Malfunction Criteria	Threshold agen AG does not go	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	scription unless authoris	Failure of one or more CAN engine messages (but not all CAN engine messages)	Time-out for more than 1,010.0 ms	 No bus off error No error failure of all CAN messages No error failure of all CAN engine messages Terminal 15 voltage > 9.0 V for more than 500.0 ms > 500.0 ms after reset 	1,010.0 1,010.0		
	O to alentid	• Message	Failure of all CAN messages but gearbox is still in position to send	Time-out for more than 2,080.0 ms	Terminal 15 voltage > 9.0 V for more than 500.0 ms 500.0 ms after reset	• 2,080.0 ms	
U010 3	Lost Commu- nication With Gear Shift Control Module "A"	Message time-out de- tection	Failure of selector lever CAN messages	Fime-out for more than 490.0 ms	 Kein bus off fehler no bus off error No error failure of all CAN messages Terminal 15 voltage > 9.0 V for more than 500.0 ms > 500.0 ms after reset 	• 490.0 ms	• 2 driv- ing cy- cles
U040 4	Invalid Data Re- ceived From Gear Shift Control Module "A"	Evaluation of selector lever CAN message counter	If the value of message counter is permanent constant or change exceeds a threshold increment an event counter	Maximum change of message counter > 5	 No failure of selector lev- er CAN mes- sages Terminal 15 voltage > 4.0 V for more than 500.0 ms 	• 50.0 ms	• 2 driv- ing cy- cles

3.5.3 Transmission Control Module, 6 speed 0D9 (2017 MY)

DTC	Fault	Monitor Strat-	Malfunction	50 6F 0D9 Threshold	Secondary Pa-	Monitor-	Frequen-
	Code De- scription	egy Descrip- tion	Criteria	Value	rameters with Enable Condi- tions	ing Time Length	cy of checks, MIL Illum
P0219	Engine Over- speed Condition	• signal range check	rotational speed of gearbox input shaft exceed a maximum value	rotational speed> 12000 rpm	terminal 15 voltage > 7.5 V for more than 500 ms and AG. Volkswagen A	• 500 ms	2 driv- ing cy- cles
P0501	Vehicle Speed Sensor "A" Cir- cuit Range/ Perform- ance	plausibility check	• calculate the speed of input shaft with the gear ratio of engaged gear on input shaft and the output shaft speed. compare the calculated speed with measured speed of input shaft	• speed difference magn tude > 330 rpm (output speed = 500rpm) 100 rpm (or put speed>=20 rpm)	shaft engaged no valid CAN output speed information	• 300° 90; ms	• 2 driving cycles
P0608	Control Module VSS Out- put "A"	plausibility check	In spite of cutted off Common High-side Switch 1 a measurable current. In spite of turned on Common High-side Switch 1 no current measurable.	CHS1 cut- ted off and CHS1- Current> 40mA CHS1 turned on and CHS1- Current< 200mA	 one-time after reset terminal 15 voltage < 18/V no short-circuit current check failure of CHS1 common high-side switch 1 voltage > 9.2 V gearbox subsystem 1 active common high-side switches not deactivated by module 2 	• 300 ms	wing cv

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria Aby Volkswagen A	Threshold Value G. Volkswagen AG	Secondary Parameters with Enable Condi-	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	ooses. in part ov:	tion	In spite of cutted off Common High-side Switch 2 a measurable current. In spite of turned on Common High-side Switch 2 no current measurable.	CHS2 cutted off and CHS2-Current> 40mA CHS2 turned on and CHS2-Current< 200mA	arantee or acce	drany liability with respect to the correctness	
		Areionammoropologinas or commercial	In spite of cutted off Common High-side Switch 3 a measurable current. In spite of turned on Common High-side Switch 3 no current measurable.	• CHS3 cutted off and CHS3-Current>40mA CHS3 turned on and CHS3-Current<200mA	Enable Condi- Tenante of acque Semsylo May Philador	of information in this occurs	
P0701	Trans- mission Control System Range/ Perform- ance	signal range check	travel sen- sor voltage gearshift fork 1/3 out of plausi- bility range	300 mV		• 300 ms	2 driv- ing cy- cles
			travel sen- sor voltage gearshift fork 2/4 out of plausi- bility range				
			travel sensor voltage gearshift fork 5/N out of plausibility range				

	1		DQ-2	50 6F 0D9		-	
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
			travel sen- sor voltage gearshift fork 6/R out of plau- sibility range				
P0702	mission Control System Electrical	• plausibility check	• In spite of	CHS1 cut off and CHS1-Current> 40 mA CHS1 turned on and CHS1-Current< 200 mA CHS2 cut off and CHS2-Current> 40 mA	 one-time after reset terminal 15 voltage < 18 V no short-circuit current check failure of CHS1 common high-side switch 1 voltage >9.2V gearbox subsystem 1 active common high-side switches not deactivated by module 2 one-time after reset terminal 15 voltage < 18 	• 300 ms	2 driving cycles
		Copyright of Commercial purposes, in part or in whole, is not or in which the property of the property	Switch 2 a measurable current. In spite of turned on Common High-side Switch 2 no current measurable.	40 mA CHS2 turned on and CHS2- Current< 200 mA	voltage < 18 V no short-circuit current check failure of CHS2 common high-side switch 2 voltage >9.2V gearbox subsystem 2 active common high-side switches not deactivated by module 2	of and liability with respect to the second information in this continues of the second in the secon	o correctno.

• In spite of cut off Common High-side Switch 3 a measurable current. In spite of turned on Common High-side Switch 3 no current measurable. ■ P0717 Input/Turbine	DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Condi-	Monitor- ing Time Length	Freque cy of check
bine Shaft Speed Shaft Speed Sensor "A" Circuit No Signal Signal Shaft No Signal Shaft Shaft 1 Speed Shaft 1 Speed Shaft 1 Speed Sensor "A" Circuit No Signal Shaft 1 Speed Spear on input Shaft 1 Speed Speed Spear on input Shaft 1 Speed S				cut off Common High-side Switch 3 a measura- ble cur- rent. In spite of turned on Common High-side Switch 3no current measura-	off and CHS3- Current> 40 mA CHS3 turned on and CHS3- Current<	tions one-time after reset terminal 15 voltage < 18 V no short-circuit current check failure of CHS3 and main pressure solenoid valve common high-side switch 1 and 2 voltage >9.2V common high-side switches not deactivated		MIL III
		bine Shaft Speed Sensor "A" Cir- cuit No Signal	check	the speed of input shaft 1 with the gear ratio of engag- age ed gear on input shaft 1 and the output shaft speed. compare the calculated speed with measured speed of input shaft 1	ence magni tude> 330 rpm (output speed = 500rpm) 100 rpm (ou put speed>=20 rpm)	 ed on input shaft 1 valid CAN output speed information speed of input shaft 1 < 25 rpm output speed > 25 rpm terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 ppm for more than 500 ms 		• 2 d ing cles

DTC Fault Code Description	Monitor Strategy Description	Malfunction Criteria • calculate the speed	Threshold Value	Secondary Parameters with Enable Conditions • gear engag-	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		the speed		• gear engag-		
		of input shaft 2 with the gear ratio of engaged gear on input shaft 2 and the output shaft speed. compare the calculated speed with measured speed of input shaft 2		ed on input shaft 2 • valid CAN output speed information • speed of input shaft 2 < 25 rpm • output speed > 25 rpm • terminal 15 voltage > 7.5 V for more than 500 ms • battery voltage > 9 V for more than 500 ms • engine speed > 680 rpm for more than 500 ms		
Gear 6 Incorrect Ratio	ing detec- tion while the gear- shift fork was control- led to en- gage sixth gear	integral that corresponds to the energy flux in the synchronic zation exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2		position = 0 control gear- shift fork valve 3 >= 5%	• 5 s does not guara, does not guara, does not guara, does not guara,	

Code Decorption by the company of the control of				DQ-2	50 6F 0D9			
Correct Ratio	DTC	Code De-	egy Descrip-			rameters with Enable Condi-	ing Time	Frequen- cy of checks, MIL Illum
correct Ratio In detection while the gear-sponds to wagen AG does not led to engage second gear In the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2 In the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 3 in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2 In the energy flux in the synchronization of clutch 2	P0731	correct	ing detec- tion while the gear- shift fork was control- led to en- gage first	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safe-		point adaptation of clutch multiplexer position = 0 control gearshift fork valve 1 >= 5% no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm for more	• 5 s	ing cy-
THORD THE THORNGALD THE		correct Ratio	ing detection while the gear-shift fork was controlled to engage second gear	that corresponds to sponds to five energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2	125 swagen AG does not	point adaptation of clutch 2 • multiplexer position = 1 • control gearshift fork valve 3>= 5% • no main pressure loss • terminal 15 voltage > 7.5 V for more than 500 ms • battery voltage > 9 V for more than 500 ms • engine speed > 680 rpm for more than 500 ms		ing cy-
3. Diagnosis and Testing			Oflydo JABINYDO VI	ler\		WO'MUNIOO, Inp		
			9/10	Protected	Olkswagen AG.	3. Di	agnosis and	Testing 10

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0733	correct Ratio	ing detection while the gearshift fork was controlled to engage third gear	integral that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 1	• integral > 125	 no slipping point adaptation of clutch 1 multiplexer position = 0 control gearshift fork valve 2 >= 5% no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm for more than 500 ms 	s Saliability with respect to	• 2 driving cycles
P0734	Gear 4 <u>เก็</u> - correct Ratio sessodun		integral that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2	• integral > 125	 no slipping point adaptation of clutch 2 multiplexer position = 1 control gearshift fork valve 4 >= 5% no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm for more than 500 ms 	the correctness of $information inthis$ 5	2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0735	Gear 5 In- correct Ratio	ing detection while the gearshift fork was controlled to engage fifth gear	integral that corresponds to the energy flux in the synchronic zation exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 1	• integral > 125	rameters with Enable Conditions no slipping point adaptation of clutch 1 multiplexer position = 1 control gearshift fork valve 1>= 5% no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm for more than 500 ms control safety valve 2	• 5 s	• 2 driving cycles
P0736	Reverse Incorrect Ratio	unable to disengage the reverse gear	• gearshift	gearshift fork position < synchronizing point regret verse gear 10% synchronizing point measured by a basic adjustment (reverse gear stays in shifted position) control gearshift fork control gearshift fork valve 3 >= 5%	(ON) >= 20% multiplexer position = 0		

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value AG. V	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		synchronizing detection while the gearshift fork was controlled to ensure gage reverse gear synchronizing detection while the gearshift fork was controlled to ensure gage reverse gear.	integral that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2 integral of	• integral > 125	 no slipping point adaptation of clutch 1 multiplexer position = 0 control gearshift fork valve 4 >= 5% no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm for more than 500 ms 		Copy and liability with respect to the consenses of Information in this order.
P0746	Pressure Control Solenoid "A" Per- for- mance/ Stuck Off	pressure in- tegral moni- toring	integral of actual pressure minus desired pressure minus drain exceeds a maximum value	 pressure integral>= 0.1 bar*s 	 desired pressure <= adapted clutch slipping point + 1 bar standing vehicle with accelerator pedal < 0.1% battery voltage > 9 V for more than 500 ms engine speed > 500 rpm 	• 300 ms	• 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		open-circuit check	desired valve current of clutch 1 exceeds a threshold simultaneous the actual valve current is smaller than a second threshold	desired current> 350 mA actual cur- rent< 50 mA	 common high-side switch 1 on, not defect and voltage > 9.2 V gearbox subsystem 1 active common high-side switches not deactivated by module 2 terminal 15 voltage > 9 V for more than 500 ms engine speed > 680 rpm 		
P0747	Pressure Control Solenoid "A" Stuck On	bressure prilipping by the purposes, in part or in whole is not commercial purposes, in part or in whole is not commercial purposes. Only the purpose of commercial purposes in part or in whole is not commercial purposes.	value	• counter > 2	gear on input shaft 1 desired pres- sure >adap- ted clutch	antee or acceptal	2 driving cycles 2 driving cycles
		ivate or commercial P					of information in this or

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		short-circuit current check	son of actual valve current with desired valve current of clutch 1	actual Nagen Current>desired current and (actual current)> 200 mA for more than 200 ms	not defect and voltage > 9.2 V • gearbox subsystem 1 active • common high-side switches not deactivated by module 2 • terminal 15 voltage > 9 V for more than 500 ms		
			Tentral Buildon Th	Protected by Copyrig	-ĐAnaga	межо Уканай	K 190 J. January 1900 J. Janua

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria Aby Volkswagen AG	Threshold Volks Value AG do	Secondary Parameters with Enable Condi-	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0751	Shift Solenoid "A" Performance/ Stuck Off	• open-circuit checks of the c	Comparison of residual current of gearbox subsystem 1 (total current at common high-side switch 1 actual current of clutch 1) at switching point of control gearshift fork valve 1 with residual current at permanent control of control gearshift fork valve 1 Congaration	1=13 V)	 common high-side switch 1 on not defect and voltage > 9.2 V gearbox subsystem 1 active common high-side switches not deactivated by module 2 change of supply voltage < 1 V duty factor change of safety valve 1 (control of safety valve 1 is stable) <= 5% duty factor change of gearshift fork valve 2 (control of gearshift fork valve 2 is stable) <= 5% duty factor of control gearshift fork valve 2 is stable) <= 5% duty factor of control gearshift fork valve 1 and steady state time > 70% terminal 15 voltage > 9V for more than 500ms engine speed > 680 rpm 		• 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strategy Description	Malfunction Criteria Wagen AG. Volkswa	Threshold Value agen AG does not go	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0756	enoid "B" Perform-	• open-circuit	Comparison of residual current of gearbox subsystem 1 (total current at common high-side switch 1 - actual current of clutch 1) at switching point of control gearshift fork valve 2 with residual current at permanent control of control gearshift fork valve 2 Control gearshift fork valve 2 Control gearshift fork valve 2	difference of residual current<= 200 mA (supply voltage at common high-side 1=7 V) 450 mA (supply voltage at common high-side 1=13 V) valent and the supplemental an	 common high-side switch 1 on, not defect and voltage > 9.2 V gearbox subsystem 1 active common high-side switches not deactivated by module 2 change of supply voltage < 1 V duty factor change of safety valve 1 (control of safety valve 1 is stable) <= 5% duty factor change of gearshift fork valve 1 is stable) <= 5% duty factor of control gearshift fork valve 1 is stable) <= 5% duty factor of control gearshift fork valve 2 > 70% and steady state time >= 50ms terminal 15 voltage > 9 V for more than 500 ms engine speed > 680 rpm 		• 2 driving cycles

DTC Code De Soription Portion
enoid "C" Performance/ Stuck Off Stu
and Andreas

Shift Sol. open-circuit check son of resond "D" rend of "D"
• terminal 15 voltage > 9 V for more than 500 ms • engine speed > 680 rpm • Rep. Gr.ST - Generic Scan Tool

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	1900	• open-circuit check	son of residual current of central control (total current at common high-side switch 3 - actual current of main presidual current of multiplexer valve with residual current at permanent control of multiplexer valve	, COL.	 no short-circuit current check failure of main pressure solenoid valve common high-side switch 1 and 2 voltage > 9.2 V common high-side switches not deactivated by module 2 change of supply voltage < 1 V multiplexer valve is controlled and steady state time >= 50 ms terminal 15 voltage > 9 V for more than 500 ms engine speed > 680 rpm 		
P0776	Pressure Control Solenoid "B" Per- for- mance/ Stuck Off	pressure in- tegral moni- toring	actual	• pressure integral >= 0.1 bar*s	 desired pressure <= adapted clutch slipping point + 1 bar standing vehicle with accelerator pedal < 0.1% battery voltage > 9 V for more than 500 ms engine speed > 680 rpm 	• 300 ms	• 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0777	Control	open-circuit check pressure buildup monitoring pressure buildup monitoring	valve current of clutch 2 exceeds a threshold simultaneous the actual valve current is smaller than a second threshold	• desired current> 350 mA actual current< 50 mA	deactivated by module 2 terminal 15 voltage > 9 V for more than 500 ms engine speed > 680 rpm	• 0 ms	• 2 drivespect of information in the point of the control of the c

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
John Miller	Ness authorised t	short-circuit current check Nolkswagen AG. Vo	son of ac-	actual current >desired current and (actual current-desired current) > 200 mA for more than 200 ms actual current of the cur	common high-side switch 2 on, not defect and voltage > 9.2 V gearbox subsystem 2 active common high-side switches not deactivated by module 2 terminal 15 voltage > 9 V for more than 500 ms engine speed > 680 rpm	• 200 ms	
P0781	1-2 Shift	• unable to disengage the first gear	• gearshift fork of first gear stays in shifted position in spite of control to disengage	• gearshift fork position > synchronizing point first gear + 10% synchronizing point measured by a basic adjustment (first gear stays in shifted position) control gearshift fork valve 2 >= 5%	 control safety valve 1 (ON) >= 20% multiplexer position = 0 desired main pressure > 2 bar no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm for more than 500 ms 	• 6000 ms	• 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0782	2-3 Shift	unable to disengage the second gear	gearshift fork of sec- ond gear stays in shifted po- sition in spite of control to disengage	• gearshift fork position < synchronizing point second gear - 10% synchronizing point measured by a basic adjustment (second gear stays in shifted position) control gearshift fork valve 4 >= 5% AG. Volkswagen A	 control safety valve 1 (ON) >= 20% multiplexer position = 1 desired main pressure > 2 bar no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine > 500 ms engine > 500 ms engine > 500 ms 	• 6000 ms	• 2 driving cycles
		adınlessalın			rpm for more than 500 ms	CC _C C _D	
P0783	3-4 Shift	unable to disengage the third gear outperformation of the properties of the third gear outperformation of the thir	• gearshift fork of third gear stays in shifted position in spite of control to disengage	• gearshift fork posi- tion < syn- chronizing point third gear - 10% synchro- nizing	 control safety valve 1 (ON) >= 20% multiplexer position = 0 desired main pressure > 2 	• 6000 ms ill with respective to the control of the	act to the

			DQ-Z	50 6F 0D9	2	1	
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen cy of checks, MIL Illun
	4-5 Shift	unable to disengage the fourth gear signal range check unable to disengage the fourth gear signal range check	gearshift fork of fourth gear stays in shifted position in spite of control to disengage wagen AG does not	• gearshift fork position > synchronizing point fourth gear + 10% synchronizing point measured by a basic adjustment (fourth gear stays in shifted position) control gearshift fork valve 3 >= 5%	 control safety valve 2 (ON) >= 20% multiplexer position = 1 desired main pressure > 2 bar no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 pm for more than 500 ms 	• 6000 ms	• 2 driving cycles
40/0	Inter- mediate Shaft Speed Sensor "A" Cir- cuit		rotational speed of input shaft 1 exceed a maximum value OR rotational speed of input shaft 2 exceed a maximum value OR volume of input shaft 2 exceed a maximum	aun	terminal 15 voltage > 7.5 Vifor more than 500 ms of information in the second	• 140 ms	• 2 driv ing cy cles

DTC Fault		DQ-2	50 6F 0D9			
Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0797 Pressure Control Solenoid "C" Stuck On	short-circuit current check	comparison of actual valve current with desired valve current of main pressure solenoid valve	actual current>desired current and (actual current- desired current) > 200 mA for more than 300 ms	switch 3 on and not de- fect • common	• 300 ms	2 driving cycles
P0829 5-6 Shift	• unable to disengage the fifth gear	gearshift fork of fifth gear stays in shifted position in spite of control to disengage. Authorised by the search of t	point	 control safety valve 1 (ON) >= 20% multiplexer position = 1 endesired main pressure > 2 bar no main pressure loss terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 600 rpm for more than 500 ms engine speed > 600 rpm for more than 500 ms 	ni _{ee Or} acce	2 driving cycles 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		unable to disengage the sixth gear Authorised by Authorise	gearshift fork of sixth gear stays in shifted po- sition in spite of control to disengage	• gearshift fork position > synchronizing point sixth gear + 10% synchronizing point measured by a basic adjustment (sixth gear stays in shifted position) control gearshift fork valve 4 >= 5%	 terminal 15 voltage > 7.5 V for more than 500 ms battery volt- 		
P0840	Trans- mission of Fluid of Pressure Sensor Switch of City- cuit	signal range check	pressure sensor voltage clutch 1 out of plau- sibility range	voltage < 100 mVORvoltage > 4900 mV		300 ms ms	• 2 driving cycles
P0841	mission Fluid Pressure Sensor/ Switch "A" Cir- cuit Range/	overpressure monitoring Pality of the sensor voltage of the	• hydraulic pressure of clutch 1 exceeds a maximum value	• pres- sure>= 15.5 bar	 signal range check is correct terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm 	• 1000 ms ess of information in this	• 2 driving cycles
P0845	Trans- mission Fluid Pressure Sensor/ Switch "B" Cir- cuit	pressure sensor volt- age clutch 2 out of plau- sibility range	pressure sensor voltage clutch 2 out of plausibility range	voltage < 100 mV OR voltage > 4900 mV		• 300 ms	• 2 driv- ing cy- cles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Vo	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time	Frequen- cy of checks, MIL Illum
P0846	Trans- mission Fluid Pressure Sensor/ Switch "B" Cir- cuit Range/ Perform- ance	• overpressing part or in whole, is not part or in whole, is not part or in whole is not part or in which it	hydraulic pressure of clutch 2 exceeds a maximum value	• pressure >= 15.5 bar	 signal range check is correct terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm 	• 1000°C	drivespect to the correctness of in class of in the correctness of the
P0864	TCM Commu- nication Circuit Range/ Perform- ance	buss off de- tection of the micro- controller	Author Cont		terminal 15 voltage > 9 V for more than 1000 ms >1000 ms af- ter reset	• 80 ms	• 2 driving cycles
P0890	TCM Power Relay Sense Circuit Low	short-circuit current check	Detection by hard ware cir- cuit	• current > 8.5 A	terminal 15 voltage > 7.5 V for more than 500 ms	• 200°	2 driv- ing cy- cles
P0914	Gear Shift Po- sition Cir- cuit	time out detection of the question and answer diagnosis	if time out of the question and answer diagnosis is detected increment an event counter	time out threshold> 100 ms	 gear message for selector lever is transmittable and selector lever message is receivable no failure of selector lever CAN messages time after Reset > 100 ms terminal 15 voltage > 7.5 V for more than 500 ms 	• 300 ms	• 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		• plausibility check of selector lever lector lever	selector lever position is not equal to negation of the inverse selector lever position selector lever position equals initialization value selector lever position equals error value or selector lever position equals error value or selector lever position is equal to negation of the inverse selector lever position but no valid position valid position	• selector lever position == Position 1 or Position 2 or Position 3 or Position 4 or Position 4 or Position 1 or Position 4 or Position 1 or Position 2 or Position 2 or Position 3 or Position 4 or Position 4 or Position 1 or Position 2 or Position 3 or Position 4 or Position 4 or Position 2 or Position 3 or Position 4 or Position 4 or Position 2 or Position 3 or Position 4 or P	 no bus off error no error failure of all CAN messages no failure of selector lever CAN messages time after Reset > 1600 ms terminal 15 voltage > 9 V for more than 1600 ms 	ms	Oraccaptam liability mile
		question and answer diagnosis	failure of question and an- swer diag- nosis	Protected by COPY	Nage Name of the N	• 1500 ms	O Juliatir
P0919	Gear Shift Po- sition Control Error	evaluation the error signal of se- lector lever CAN mes- sage	error flag of not de- terminable selector lever posi- tion is set	103g	 no failure of selector lever CAN messages terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm 	• 20 ms	2 driv- ing cy- cles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		error detection of the question and answer diagnosis and a second control of the question and answer diagnosis and analysis a	if the selector lever position is equal to age negation of the inverse selector lever position but is not valid (position == L, P4, P3, P2, or P1) AND is not in error state (position!= error) AND initialization value with the initialization flag not set then increment an event counter	en AG does not gua _{ra}	V for more than 500 ms than 500 ms		
	, V,	error detection of the question and answer diagnosis	• if the answer of the diagnosis is wrong an event counter is incremented	DA nagen Ading	 no failure of selector lever CAN messages terminal 15 voltage > 7.5 V for more than 500 ms 	• 100 ms	

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		plausibility check of selector lever position	if the selector lever position is not equal to negation of the inverse selector lever position OR selector lever position equals initialization value but the initialization flag is not set		 no failure of selector lever CAN messages terminal 15 voltage > 7.5 V for more than 500 ms battery voltage > 9 V for more than 500 ms engine speed > 680 rpm 	• 400 ms	
		ik ⁸ ditu ⁶	OR • selector lever position equals error value then increment an event counter	agen AG. Volkswag	en AG does not guarant	de or ecceptions.	
P0929	Gear Shift Lock Solenoid/ Actuator Control Circuit "A" Range/ Perform- ance	validity check of shiftlock position signal which is a second character of the charac	if the shift-lock position signal is not valid (position != error, deactive, active or init) increment an event counter		 no failure of selector lev- er CAN mes- sages terminal 15 voltage > 7.5 V for more than 500 ms 	• 20 ms	• 2 driving cy- ing cy- cles
P2711	Unexpected Mechanical Gear Disengagement	unable to engage a gear on shaft 1 And the control of the contro	the number of successive engagements of the same gear on shaft 1 exceeds a maximum value	• counter>=6	 battery voltage > 9 V for more than 500 ms engine speed > 680 rpm for more than 500 ms 	• 0 ms	• 2 driv- ling cy- cles

DTC	Fault	Monitor Strat-	Malfunction	50 6F 0D9 Threshold	Secondary Pa-	Monitor-	Frequen-	
	Code De- scription		Criteria	Value	rameters with Enable Condi- tions	ing Time Length	cy of checks, MIL Illum	
		unable to engage a gear on shaft 2	the number of successive engagements of the same gear on shaft 2 exceeds a maximum value					
		detect dis- engage- ment of gears on shaft 1 with- out control	In spite of a constant desired gear dis- engage- ment counter exceeds a maximum value	• counter>3	 battery voltage > 9 V for more than 500 ms engine speed > 680 rpm for more than 500 ms output speed >= 12 rpm 			
		detect dis- engage- ment of gears on shaft 2 with- out control	In spite of a constant desired gear dis- engage- ment counter exceeds a maximum value	ijtedinlessauthoris	aby Volkswagen AG. V	olkswagen A (doesnot guard	antee of accept and the
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		1055 aut	DQ-2	50 6F 0D9	O P Q	C _C	
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2723	Control Solenoid "E" Per- for-	Spen-circuit part or in who of or	current of gearbox subsystem 1 (total	• residual current <= 150 mA (supply voltage at common high-side 1=7 V) 300 mA (supply voltage at common high-side 1=13 V)	 common high-side switch 1 on, not defect and voltage > 9.2 V gearbox subsystem 1 active common high-side switches not deactivated by module 2 change of supply voltage < 1 V duty factor of control gearshift fork valve 1 and 2 <= 10 % duty factor of safety valve 1 >= 53% and steady state time >= 50 ms terminal 15 voltage > 9 V for more than 500 ms engine speed > 680 rpm 	• 300 ms	2 driving cycles cles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	Pressure Control Solenoid "F" Per- for- mance/ Stuck Off	• open-circuit check	current of gearbox subsystem 2 (total current at common high-side switch 2 actual current of clutch 2) is smaller than a minimum value	300 mA (supply voltage at common high-side 2=13 V)	 9.2 V gearbox subsystem 2 active common high-side 		
U010 0	Commu- nication With ECM/ PCM "A"	Timeout Check	failure of all CAN engine messages	time-out for more than 490 ms	 no bus off error no error failure of all CAN messages terminal 15 voltage > 9 V for more than 1000 ms >1000 ms after reset 	• 490 ms	• 2 driv- ing cy- cles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		. w Volkswagen Af	failure of one or more CAN engine messages (but not all CAN engine messages) a. Volkswagen AGO	• time-out for more than 1010 ms	 no bus off error no error failure of all CAN messages no error failure of all CAN engine messages terminal 15 voltage > 9 V for more than 1000 ms >1000 ms after reset 	• 1010 ms	
you	ille dunes sautho	_{lsed} by Volkswagen Af	failure of all CAN messages but gear- box is still in position to send	time-out for more than 450 ms	terminal 15 voltage > 9 V for more than 1000 ms >1000 ms after reset	• 450 ms	
Orcommercial purposes, in part or in west	Lost Commu- nication With Gear Shift Control Module "A"	Timeout Check	failure of selector lever CAN messages	time-out for more than 490 ms	 kein Bus off Fehler no bus off error no error fail- ure of all CAN mes- sages terminal 15 voltage > 9 V for more than 1000 ms, >1000 ms af- ter reset 	• 490 ms	• 2 driv- ing cy- cles
U040 4	Invalid Data Re- ceived From Gear Shift Control Module "A"	• evaluation of selector lever CAN message counter	if the value of message counter is permanent constant or change exceeds a threshold increment an event counter	maximum change of message counter 55	 no failure of selector lever CAN messages terminal 15 voltage > 7.5 V for more than 500 ms 	• 50 ms	2 driv- ing cy- cles

Transmission Control Module, 6 speed 0D9 (2018 MY) 3.5.4

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria Ludolkswagen AG. V	Threshold Value olkswagen AG does	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0219	Engine Over- speed Condition	Speed sensor of gear- box input shaft signal range check	Rotational speed of gearbox input shaft exceed a maximum value	Rotational speed > 12,000 RPM	Terminal 15 voltage > 7.5 V For more than 500.0 ms	• 500.0 ms	• 2 driv- ing cy- cles
P0501	Speed Young	Output speed sensor plausibility check Oogle and the sensor plausibility	Calculate the speed of input shaft with the gear ratio of engaged gear on input shaft and the output shaft speed Compare the calculated speed with measured speed of input shaft Compare the calculated speed with measured speed of input shaft Compare the calculated speed with measured speed of input shaft Compare the calculated speed with measured speed of input shaft	Speed difference magnitude > 330 RPM (Output speed = 500 RPM) - 100 RPM (output speed >= 2,000 RPM) RPM)	 No valid CAN output speed information Output speed > 25 RPM Or Speed of input shaft > 1,000 RPM Terminal 15 voltage > 7.5 V For more 	${m \omega}_{{ m cec}}$ spect to the correctness of information in this ${m \omega}$	• 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0606	Control Module Process-or	Common high-side switch 1 plausibility check Common high-side switch 2 plausibility check Change of the check of the chec	switch 1 a measurable current In spite of turned on common high-side switch 1 no current measurable In spite of current current measurable	CHS 1 turned on and CHS 1 - current < 200.0 mA CHS 2 cut off and CHS 2 - current > 40.0 mA CHS 2 turned on and CHS 2 - current < 200.0 mA	 One time after reset Perminal 15 voltage ≤ 18.0 V No short-circuit current check failure of CHS 1 Common high-side switch 1 voltage > 9.2 V Gearbox subsystem 1 active Common high-side switches not deactivated by module 2 One time after reset Terminal 15 voltage < 18.0 V No short-circuit current check failure of CHS 2 Common high-side switch 2 voltage > 9.2 V Gearbox subsystem 2 active Common high-side switches not deactivated by module 2 	ilee or accept any	with respect to the correctness of information in the contract of the correctness of the
P0607	Control Module Perform- ance	 Travel sen- sor for gear- shift fork of 1/3 gear signal range check 	Travel sensor voltage gearshift fork 1/3 out of plausibility range	 Voltage < 300.0 mV Or Voltage > 4,700.0 mV 		• 300.0 ms	• 2 driv- ing cy- cles

Code Description Criteria Value rameters with Enable Conditions Travel sensor voltage gearshift signal range check Travel sensor voltage gearshift signal range check Travel sensor voltage Sor for gear sensor sor for gear sensor voltage			DQ-2	50 6F 0D9				
sor for gear- shift fork of 2/4 gear signal fork 2/4 out range of plausi- check bility range • Travel sen sor for gear- shift fork of S/N gear gearshift sensor voltage gearshift	DTC	Code De-	egy Descrip-			rameters with Enable Condi-	ing Time	Frequen- cy of checks, MIL Illum
P0608 Gentrol • Common • In spite of • CHS 3 cut • One time af- 6 300.0 • 2 dr Module high-side cut off off and ter reset 6 300.0 • 2 dr ing	P0608	Module VSS Out- put A"	sor for gear-shift fork of 2/4 gear signal range check Travel sensor for gear-shift fork of 5/N gear signal range check Travel sensor for gear-shift fork of 6/R gear signal range check Common high-side switch 3 plausibility check	sensor voltage gearshift fork 2/4 out of plausi- bility range **29 Travel sensor voltage gearshift fork 5/N out of plausibility range • Travel sensor voltage gearshift fork 6/R out of plausibility range • In spite of cut off common high-side switch 3 a measura- ble current • In spite of	 CHS 3 cut off and CHS 3 - current > 40.0 mA CHS 3 turned on and CHS 3 - current < 200.0 mA 	One time after reset Terminal 15 voltage < 18.0 V No short-circuit current check failure of CHS 3 and main pressure solenoid valve Common high-side switch 1 and 2 voltage > 9.2 V Common high-side switches not deactivated	otto the correctness and a sound	• 2 driving cycles

	DQ-250 6F 0D9								
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum		
P0717	Input/Turbine Shaft Speed Sensor "A" Circuit No Signal	Speed sensor son input shaft 1 plausibility check	Calculate the speed of input shaft 1 with the gear ratio of engaged gear on input shaft 1 and the output shaft speed Compare the calculated speed with measured speed of input shaft speed of input shaft	Speed difference magnitude > 330 RPM (Output speed = 500 RPM) - 100 RPM (output speed >= 2,000 RPM) RPM)	 Gear engaged on input shaft 1 Valid CAN output speed information Speed of input shaft 1 < 25 RPM Output speed > 25 RPM Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 	Operation the correctness of information in this of the correctness of information in this of the correctness of information in the correctness of			



	Sauth	, et	DQ-2	50 6F 0D9	O		
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P078 B00/w in part or in part or in whole	Reverse	• Gearbox mechatronic unable to disengage the reverse gear	Gearshift fork of reverse gear stays in shifted position in spite of control to disengage Syuth	Gearshift fork position < synchronizing point reverse gear -10.0% synchronizing point measured by a basic adjustment (reverse gear stays in shifted position) Control gearshift fork valve 3 ≥ 5.0%	 Control safety valve 2 (on) >= 20.0% Multiplexer position 0= 0.0 [-] Desired main pressure > 2.0 bar > 2.0 bar > 2.0 bar > 7.5 For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 	• 6,000.0 ms	• 2 driving cycles

			DO 21	50 6F 0D9	eneric Scan Tool		
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P072 C	Stuck in Gear 1	Gearbox mechatronic unable to disengage the first gear Holium and the first gear gear gear gear gear gear gear gear	Gearshift fork of first gear stays in shifted position in spite of control to disengage Bessauthorised by Volker and the season of the	 Gearshift fork position > synchronizing point first gear +10.0% synchronizing point measured by a basic adjustment (first gear stays in shifted position) Control gearshift fork valve 2 >= 5.0% 	 Control safety valve 1 (on) >= 20.0% Multiplexer position == 0.0 [-] Desired main pressure > 2.0 bar No main pressure loss Terminal 15 voltage > 7.5 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 	ms ms	ing cycles
		or commercial purposes, in part or in whe	Rindo inginado Ag pe	Brojord	.ĐA nagswaylo V van	Applied On The Minds	correctness of information in this

	DQ-250 6F 0D9									
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum			
P072 D	Stuck in Gear 2	Gearbox mechatron- ic unable to disengage the second gear Order in bart or in whole, is of order in bart or in whole in the second gear. Order in bart or in whole is of order in bart or in ba	Gearshift fork of second gear stays in shifted position in spite of control to disengage authorized by VolksW authorized by VolksW authorized by VolksW	Gearshift fork position < synchronizing point second gear -10.0% synchronizing point measured by a basic adjustment (second gear stays in shifted position) Control gearshift fork valve 4 >= 5.0%	 Control safety valve 2 (on) >= 20.0% Multiplexer position == 1.0 [-] Desired main pressure > 2.0 bar No main pressure loss Terminal 15 A cycltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 	ms of acceptant liability	ing s ing s ing s			
		dund leis John John John John John John John John	Ados iugurdos Aqpaysi	ejoi ^d	DA nagswaylo V kd mby	K do Silahho Gis	information			

				DQ-2	50 6F 0D9			
	DTC	Fault Code De- scription	Monitor Strat- egy Descrip- wagen A tion olkswag	Malfunction Criteria en AG does not on.	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
ommercial purposes, in part or in whole, is not being the standing of the stan	PO72 HIT STATE OF STA	Stuck in Gear 3	• Gearbox mechatronic unable to disengage the third gear	Gearshift fork of third gear stays in shifted position in spite of control to disengage	Gearshift fork position < synchronizing point third gear -10.0% synchro- nizing point measured by a basic adjust- ment (third gear stays in shifted position) Control gearshift fork valve 1 >= 5.0%	 Control safety valve 1 (on) >= 20.0% Multiplexer position == 0.0 [-] Desired main pressure > 2.0 bar No main pressure loss Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 	• 6,000.0 ms	• 2 driving cycles

	DQ-250 6F 0D9										
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum				
P072 F	Stuck in Gear 4	Gearbox mechatron- ic unable to disengage the fourth gear Whole of commercial purposes, in part or in whole, is not only to a part or in whole in the fourth gear. Whole of commercial purposes, in part or in whole, is not only to a part or in the purpose of commercial purposes. Whole of commercial purposes in part or in the purpose of commercial purposes.	ed undes sauthorised by v	measured by a basic adjustment (fourth gear stays in shifted position) Control gearshift fork valve 3 >= 5.0%	 Control safety valve 2 (on) >= 20.0% Multiplexer position == 1.0 [-] Pesired main pressure 2.0 bar No main pressure loss Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 		cy en espect to the correctness of information in this especial correctness of information in this especial correctness of the correctne				
			S. O. BINGOO Y	Protectedb	JA OIKEWAGEN A.G.	gybjyddo ^O					

		DQ-2	50 6F 0D9			
DTC Fault Code De scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P073 Stuck in Gear 5	• Gearbox mechatronic unable to disengage the fifth gear	Gearshift fork of fifth gear stays in shifted position in spite of control to disengage Vagen AG does not g	Gearshift fork position > synchronizing point fifth gear +10.0% synchronizing point measured by a basic adjustment (fifth gear stays in shifted position) Control gearshift fork valve 2 >= 5.0% Application of the position of	ty valve 2 (on) >= 20.0% Multiplexer position == 1.0 [-] Desired main pressure > 2.0 bar No main pressure loss Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms For more than 500.0 ms	• 6,000.0 ms	• 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P073 B	Stuck in Gear 6	Gearbox mechatron-ic unable to disengage the sixth gear	• Gearshift fork of fork of sixth gear stays in shifted position in spite of control to disengage	• Gearshift fork position > synchronizing point sixth gear +10.0% synchronizing point measured by a basic adjustment (sixth gear stays in shifted position) • Control gearshift fork valve 4 >= 5.0%	 Control safety valve 2 (on) >= 20.0% Multiplexer position == 0.0 [-] Desired main pressure > 2.0 bar No main pressure loss Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 	ms FOR OF ROCE POPULARY	

DQ-250 6F 0D9								
	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	
E	Unable to Engage Reverse	mechatron- ic synchro- nizing de- tection while the gearshift fork was controlled to engage reverse gear	Integral that corresponds to the energy flux in the synchronization exceeds a maximum value The integral calculation depends on synchronizing slip and duty factor of the safety valve 2	• Integral > 125.0 [-]	 No slipping point Adaptation of clutch 1 Multiplexer position == 0.0 [-] Control gearshift fork valve 4 >= 5.0% No main pressure loss Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery volt- 		• 2 driving cycles	

			DO. 20	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P073 F	0	mechatron- ic synchro- nizing de- tection while the gearshift fork was controlled to engage first gear			than 500.0	& and liability with respect to the co	2 driving cycles
	CLAVE.	od and bands of commercial party of the part	Protected by copyrig	.əA nə	тs	ss of information in this occurrence.	

	DQ-250 6F 0D9									
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum			
P0746	Pressure Control Solenoid "A" Per- for- mance/ Stuck Off	Solenoid valve clutch 1 open-circuit check Marie ad by Volkswage Marie ad by Volkswa	Desired valve current of clutch 1 exceeds a threshold simultaneous The actual valve current is smaller than a second threshold AG. Volkswagen A	Desired current > 350.0 mA Actual current < 50.0 mA	 Common high-side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high-side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM 	• 300.0 ms	• 2 driving cycles			
P0747 Port or in whole, in part or in whole, is	Pressure Control Solenoid "A" Stuck On	• Solenoid valve clutch 1 short-circuit current check	Comparison of actual valve current with desired valve current of clutch 1	Actual current > desired current and (actual current – desired current) > 200.0 mA For more than 200.0 ms	 common high-side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high-side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V For more than 500.0 	• 200.0 ms	2 driving cycles			

			uthorise DQ-2	50 6F 0D9	uarant _e	300
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	A Malfunction Criteria	Threshold Value	rameters with in	Monitor- ng Time Length cy of checks, MIL Illum
P074 A	Unable To Engage Gear 2	Gearbox mechatronic synchronizing detection while the gearshift fork was controlled to engage second gear	Integral that corresponds to the energy flux in the synchronization exceeds a maximum value The integral calculation depends on synchronizing slip and duty factor of the safety valve 2	• Integral > 125.0 [-]	 No slipping point Adaptation of clutch 2 Multiplexer position == 1.0 [-] Control gearshift fork valve 3 >= 5.0% No main pressure loss Terminal 15 voltage > 7.5 V For more than 500.0 Mms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 	2 driving cycles Copect to the correctness of information in this contract the correctness of information in the correctness of inf

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P074 C	To Engage Gear 4	Gearbox mechatron- ic synchro- nizing de- tection while the gearshift fork was controlled to engage fourth gear Note that the search of the search	Integral that corresponds to the energy flux in the synchronization exceeds a maximum value The integral calculation despends on synchronizing slip and duty factor of the safety valve 2	• Integral > 125.0 [-]	 No slipping point Adaptation of clutch 2 Multiplexer position == 1.0 [-] Control gearshift fork valve 4 >= 5:0% not gearshift fork valve 4	• 5.0 s	oriv- cy- cy- inges 2 inges - information is

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P074 D	Unable To Engage Gear 5	Gearbox mechatron-ic synchronizing detection while the gearshift fork was controlled to engage fifth gear Additional and the search of t	Integral that corresponds to the energy flux in the synchronization exceeds a maximum value The integral calculation depends on synchronizing slip and duty factor of the safety valve 1	• Integral > 125.0 [-]	 No slipping point Adaptation of clutch 1 Multiplexer position == 1.0 [-] Control gearshift fork valve 1 >= 5.0% No main pressure loss Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 	• 5.0 s	2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P074 E	Unable To En- gage Gear 6	Gearbox mechatron- ic synchro- nizing de- tection while the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift fork was controlled to engage sixth gear White the gearshift for	• The integral calculation depends on synchronizing slip and duty factor of the safety valve 2		 For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms 		• 2 driv- ing cy- cles
			itected by copyright	G. Pro	A negswello V Votinging		

DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequer cy of checks MIL Illui
P0751	Shift Sol- enoid "A" Perform- ance/ Stuck Off	Gearshift fork valve 1 open-circuit check	Comparison of residual current of gearbox subsystem 1 (total current at common high-side switch 1 – actual current of clutch 1) at switching point of control gearshift fork valve 1 with residual current at permanent control of control gearshift fork valve 1 with residual current at permanent control of control gearshift fork valve	high-side 1.0 = 13.0 V)	 Common high-side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high-side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 1 (control of safety valve 1 is stable) <= 5.0% 	• 300.0 ms	• 2 dri ing c cles
Ale dillight of the state of th	thorisedbyVolk	Swagen AG. Volkswa	1 gen AG does not gua	rantee or acceptanteller	 Duty factor change of gearshift fork valve 2 (con- trol of gear- shift fork valve 2 is sta- ble) <= 5.0% 		
					• Duty factor of control gear- shift fork valve 1 > 70.0%		
					• Steady state stime >= 50.0 ms		
		$\bigvee \bigwedge$			• of Terminal 15 in voltage > 9.0 V		
O LIND				HARMON I BALLO ON THE MAN THE PARTY OF THE P	For more than 500.0 ms Engine		
Of BUILD) illia			Mileur, Cobbin	speed > 680 RPM		

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0756	Shift Solenoid "B" Performance/ Stuck Off	• Gearshift fork valve 3 open-circuit check	fork valve 3	common high-side 2.0 = 7.0 V) – 450.0 mA (supply voltage at common high-side 2.0 = 13.0 V)	deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 2 (control of safety valve 2 is stable) <= 5.0% Duty factor change of gearshift fork valve 4 (control of gearshift fork valve 4 is stable) <= 5.0%	9. 300.0 ms	• 2 driv- ing cy- ing

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0766	Shift Solenoid "D" Performance/ Stuck Off	Gearshift fork valve 4 open-circuit check Opinion of or in whole is a commercial purpose of commercial p	2 (total	voltage at	 Common high-side switch 2 on, not defect and voltage > 9.2 Volumes. Gearbox subsystem 2 active Common high-side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor change of safety valve 2 (control of safety valve 2 is stable) <= 5.0% Duty factor change of gearshift fork valve 3 is stable) <= 5.0% Duty factor of control of gearshift fork valve 3 is stable) <= 5.0% Duty factor of control gearshift fork valve 3 is stable) <= 5.0% Terminal 15 volve 4 > 70.0% And Steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM 	aundoo juaundo	• 2 driv- ing cy- ings • information in this

			wagen DQ12	50/6F@D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0771	enoid "E" Performance/ Stuck Off Stu	• Multiplexer valve open-circuit check	Comparison of residual current of central control (total current at common high-side switch 3 – actual current of main pressure valve and cooling oil valve) at switching point of multiplexer valve with residual current at permanent control of multiplexer valve Total current at permanent control of multiplexer valve Total current at permanent control of multiplexer valve Total current at permanent control of multiplexer valve	voltage at common high-side 1, 2 and terminal 15 = 7.0 V) - 300.0 mA (maximum of supply voltage at common high-side 1, 2 • And • Terminal 15 = 13.0 V)	 Common high-side switch 3 on and not defect No short-circuit current check failure of main pressure solenoid valve Common high-side switch 1 and 2 voltage > 9.2 V Common high-side switches not deactivated by module 2 Change of supply voltage < 1.0 V Multiplexer valve is controlled and steady state time >= 5.0% Terminal 15 voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM 	• 300.0 ms • with respect to the correctness of information in the correc	• 2 driving cycles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0776	Pressure Control Solenoid "B" Per- for- mance/ Stuck Off	Solenoid valve clutch 2 open-cir- cuit check	Desired valve cur- rent of clutch 2 exceeds a threshold simultane- ous the ac-	 Desired current > 350.0 mA Actual current < 50.0 mA 	Common high-side switch 2 on, not defect and voltage > 9.2 V Gearbox	• 300.0 ms	2 driv- ing cy- cles
			tual valve current is smaller than a sec- ond threshold		 subsystem 2 active Common high-side switches not deactivated 		
					by module 2 Terminal 15 voltage > 9.0		
				s authorised	Terminal 15 voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM	tswagen AG _d	pes not guaran
			-	in diction of the second	• Engine speed > 680 RPM		
P0777	Pressure Control Solenoid "B" Stuck On	Solenoid valve clutch 2 short-cir- cuit current check	Comparison of actual valve current with desired valve current of clutch 2	Actual current > desired current and (actual current – desired current) > 200.0 mA	Common high-side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem 2 active		• 2 driving cycles
			ommercial purpose	• For more than 200.0 ms	Common high-side switches not deactivated by module 2		
				Signification of the state of t	• Terminal 15 voltage > 9.0 V		
				S. S. HOLINGO WOLING	For more than 500.0 ms Engine speed > 680 RPM	. ĐA nag	³ UIDA AOIKEMS
P0791	Inter- mediate Shaft Speed Sensor "A" Cir- cuit	Speed sen- sor input shaft 1 sig- nal range check	Rotational speed of input shaft 1 exceed a maximum value	Rotational speed > 12,000 RPM	 Terminal 15 voltage > 7.5 V For more than 500.0 ms 	• 140.0 ms	2 driv- ing cy- cles

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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Speed sen- sor input shaft 2 sig- nal range check	Rotational speed of input shaft 2 exceed a maximum value				
P0797	Pressure Control Solenoid "C" Stuck On	Main pressure solenoid valve short-circuit current check	Comparison of actual valve current with desired valve current of main pressure solenoid valve	Actual current > desired current and (actual current – desired current) > 200.0 mA For more than 300.0 ms	high-side switch 3 on and not de- fect Common high-side switch 1 and 2 voltage > 9.2 V Common high-side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V For more than 500.0	• 300.0 ms	• 2 driving cycles
20805	Clutch Position Sensor "A" Cir- cuit	Pressure sensor clutch 1 sig- nal range check	Pressure sensor voltage clutch 1 out of plau- istility	 Voltage < 100.0 mV Or Voltage > 		• 300.0 ms	2 driving cycles
			range or commercial purposes, in spinity	Janados inginados Vali	Protected	Kewagen AG.	• 2 driving cycles

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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
bosto or commercial purposes, in part or in whole, is not beginned to the commercial purposes, in part or in whole, is not begin and the commercial purposes.	Position Control Error	Pressure of clutch 1 pressure integral monitoring Pressure of clutch 1 overpressure monitoring Pressure of clutch 1 overpressure monitoring	actual pressure minus desired pressure minus drain exceeds a God maximum value • Hydraulic pressure of clutch 1 exceeds a maximum value	• Pressure >= 15.5 bar	Desired pressure <= adapted clutch slipping point + 1.0 bar Standing vehicle with accelerator pedal < 0.1% Battery voltage > 9.0 V For more than 500.0 ms Signal range check is correct Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 7.5 V	• 300.0 ms	2 driving cycles
		Anajoajo19	.ĐA nəbe	W≥vi	• Engine speed > 680 RPM		

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
late of commet		Pressure of clutch 1 pressure buildup monitoring Pressure of clutch 2 pressure integral monitoring Pressure of clutch 2 pressure integral monitoring Proposition of the pressure integral monitoring Proposition of the pressure of clutch 2 pressure integral monitoring Proposition of the pressure of clutch 2 pressure integral monitoring Pressure of clutch 1 pressure of clutch 2 pressure of clutch 2 pressure integral monitoring	Integral of actual pressure minus de-		 Terminal 15 Voltage > 7.5 For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM Desired pressure <= adapted 	• 0.0 ms	

		dby	DO-2	50 6F 0D9	9425		1
DTC	Fault Code De- scription	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	or commercial purposes, in part or in whole, is not be seen that the second purposes in part or in whole, is not be seen that the second purposes in part or in whole, is not be seen that the second purposes in part or in whole, is not be seen that the second purposes in part or in whole, is not be seen that the second purposes in part or in whole, is not be seen that the second purposes in part or in whole, is not be seen that the second purposes in part or in whole, is not be seen that the second purpose in part or in whole, is not be seen that the second purpose in the second purpose i	Pressure of clutch 2 overpressure monitoring Pressure of clutch 2 pressure buildup monitoring	pressure of clutch 2 exceeds a maximum value	• Pressure >= 15.5 bar • Counter > • 2 • DA Naggen Ago.	 Signal range check is correct Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engaged gear on input shaft 2 Desired pressure > adapted clutch slipping point - 0.2 bar Output speed < 200 RPM Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM 	• 0.0 ms	
P087 A	Clutch Position Sensor "B" Cir- cuit	Pressure sensor clutch 2 sig- nal range check	Pressure sensor voltage clutch 2 out of plausibility range	 Voltage < 100.0 mV Or Voltage > 4,900.0 mV 		• 300.0 ms	2 driv- ing cy- cles

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0914	Shift Position Circuit "A"	CAN interface selector lever plausibility check of selector lever Okean AG. Volk Okean AG. Volk Okean AG. Volk Okean AG. Volk Okean AG. Volk Okean AG. Volk Okean AG. Volk Okean AG. Volk Okean AG. Volk Okean	Selector lever position is not equal to negation of the inverse selector lever position equals initialization value Or Selector lever position equals initialization value Or Selector lever position equals error value Or Selector lever position equals error value Or Selector lever position is equal to negation of the inverse selector lever position but no valid position	Selector lever position == Position 1 or Position 2 or Position 3 or Position 4 or Position L Suarante Correct Position L	 No bus off error No error failure of all CAN messages No failure of selector lever CAN messages Time after reset > 1,100.0 ms Terminal 15 voltage > 9.0 V For more than 1,100.0 ms 	• 1,000.0 ms	e 2 driving cycles
TO BROWN TO BE	Andon Habildon	• CAN interface selector lever question and answer diagnosis	Failure of question and answer diagnosis Output Mahubihdoo jilahnoo	 No bus off error No error failure of all CAN messages No failure of selector lever CAN messages Time after re- 	• 1,500.0 ms		

			DQ-2	50 6F 0D9				
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	
P0919	Gear Shift Po- sition Control Error	CAN interface selector lever evaluation the error signal of selector lever CAN message	Error flag of not determinable selector lever position is set	e ilited under state of the sta	 No failure of selector lever CAN messages Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM 	• 20.0 ms	• 2 driving cycles	s or accept any liability
		CAN interface selector lever plausibility check of selector lever position	If the selector lever position is not equal to negation of the inverse selector lever position Or Selector lever position equals initialization flag is not set Or Selector lever position equals error value then increment an event counter	Restled to Billidos HOLINGO	 No failure of selector lever CAN messages Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM no failure of selector lever CAN messages terminal 15 voltage > 7.5 V for more than 500 ms 	• 400.0 ms	NSMON KAMBIN	do Chillian Market Chillian Ch

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		CAN inter- face selec- tor lever val- idity check of selector lever posi- tion	If the selector lever position is equal to negation of the inverse selector lever position but is not valid (position == L, P4, P3, P2, or P1) If the selector lever position of the inverse selector lever position but is not valid (position == L, P4, P3, P2, or P1)		 No failure of selector lever CAN messages Terminal 15 voltage > 7.5 V For more than 500.0 ms 	• 20.0 ms	
		inpart or in whole, is not be mile of the	And Is not in error state (position != error) And Equals not the initialization value with the initialization flag not set Then increment an event counter	agen AG. Volkswage	n AG does not guarante	* or *cceptent liability	, with respect to the corre
		face selec- tor lever val- idity check of shiftlock position sig- nal	lock position signal is not valid (position!= error, deactive, active or init) increment an event counter		DA 119 B S NO NO THO THE PARTY OF THE PARTY	ing the state of t	ectness of information :
ı	1		Co italitydoo yd belief	Moral .	DA nagswaylo Vydłngin	900 -	ı

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2711				• Time out threshold > 100.0 ms	 Gear message for selector lever is transmittable And Selector lever message is receivable No failure of selector lever CAN messages Time after reset > 100.0 ms Terminal 15 voltage > 7.5 V For more than 500.0 ms No failure of selector lever CAN messages Terminal 15 voltage > 7.5 V For more than 500.0 ms Battery voltage > 9.0 V 	300.0 ms 100.0 ms 0.0 ms	
	ted Me- chanical Gear Dis- engage- ment	• Gearbox mechatronic unable to engage a gear on shaft 1 • Gearbox mechatronic unable to engage a gear on shaft 2	ber of suc- cessive	-ĐA nagawe _{Allo} V _V	.⊚\age > 9.0 V		ing cy- cles
			gear on shaft 2 ex- ceeds a maximum value				

			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Gearbox mechatronic detect disengagement of gears on shaft 1 without control Gearbox mechatronic detect disengagement of gears on shaft 2 without control	 In spite of a constant desired gear disengagement counter exceeds a maximum value In spite of a constant desired gear disengagement counter exceeds a maximum value 	• Counter > 3.0 [-]	 Battery voltage > 9.0 V For more than 500.0 ms Engine speed > 680 RPM For more than 500.0 ms Output speed >= 12 RPM 		



			DQ-2	50 6F 0D9			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
commercial purposes, in part or in whole, is not.	Pressure Control Solenoid "E" Per- for- mance/ Stuck Off	• Safetywagen Avalve 1 open-circuit check	• Residual current of gearbox subsystem 1 (total current at common high-side switch 1 – actual current of clutch 1) is smaller than a minimum value	Residual current <= 150.0 mA (supply voltage at common high-side 1.0 = 7.0 V) – 300.0 mA (sup- ply voltage at common high-side 1.0 = 13.0 V)	high-side switches not deactivated by module 2 Change of supply volt- age < 1.0 V Duty factor of control gear- shift fork valve 1 and 2 <= 10.0% Duty factor of safety valve		2 driving cycles

Strat- Malfunction crip- Criteria	Threshold Value	Secondary Pa- rameters with	Monitor-	Frequen-
		Enable Condi- tions	ing Time Length	cy of checks, MIL Illum
• Residual current of gearbox subsystem 2 (total current at common high-side switch 2 – actual current of clutch 2) is smaller than a minimum value	• Residual current <= 150.0 mA (supply voltage at common high-side 2.0 = 7.0 V) – 300.0 mA (supply voltage at common high-side 2.0 = 13.0 V)	high-side switches not deactivated by module 2 Change of supply volt- age < 1.0 V Duty factor of control gear shift fork valve 3 and 4 <= 10.0% Duty factor of safety valve 2 >= 53.0% And Steady state time >= 50.0 ms Terminal 15 voltage > 9.0	• 300.0 ms	• 2 driving cles
TO BURDO HIBIADO	Protected by	olkswagen AG.	Vedinghydod	gur.
	Copyright of the state of the s	Protected by Will British in Mark or in whole is not possibly in the state of the s	safety valve 2 >= 53.0% • And • Steady state time >= 50.0 ms • Terminal 15 voltage > 9.0 V • For more than 500.0 ms • Engine speed > 680 RPM	than 500.0 ms • Engine speed > 680 RPM

			DQ-2	50 6F 0D9				
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	
P2767	bine Shaft Speed Sensor "B" Cir- cuit No Signal	sor input shaft 2 plau- sibility check	part or in who	de la	 Valid CAN output speed information Speed of input shaft 2 < 25 RPM Output speed > 25 RPM Terminal 15 voltage > 7.5 V For more than 500.00 V 	• 900.0 ms	• 2 driving cycles	ntee or acceptany lieb.
U000 1	Fligh Speed CAN Commu- nication Bus	CAN-Bus off detec- tion of the microcon- troller	ommercial purposes, in	50 to alanit	 Terminal 15 voltage > 9.0 V For more than 2,500.0 ms > 2,500.0 ms after reset 	• 280.0 ms	• 2 driv- ing cy- cles	
U000 2	High Speed CAN Commu- nication Bus Per- formance	CAN total interface message time-out de- tection	Failure of all CAN messages but gear- box is still in position to send	• Time-out for more than 450.0	 Terminal 15 voltage > 9.0 V For more than 2,500.0 ms > 2,500.0 ms after reset 	• 450.0	• 2 driving cycles	hundoo tuburi

			, DQ-2	50 6F 0D9			J. P.
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
U010 0	Lost Commu- nication With ECM/ PCM "A"	CAN inter- face engine control unit message time-out de- tection	Failure of main CAN engine message message • Failure of main CAN engine message • Failure of	Time-out for more than 490.0 ms	 No bus off error No error failure of all CAN messages Terminal 15 voltage > 9.0 V For more than 2,500.0 ms > 2,500.0 ms after reset 	ms	• 2 driving cycles
U010 3	Lost Commu- nication With Gear Shift Control Module "A"	CAN inter- face selec- tor lever message time-out de- tection	Failure of selector lever CAN messages	for more than 490.00 ms	 No bus off error No error failure of all CAN messages Terminal 15 voltage > 9.0 V For more than 2,500.0 ms > 2,500.0 ms after reset 	• 490.0	2 driv- ing cy- cles
U040 4	Invalid Data Re- ceived From Gear Shift Control Module "A"	CAN interface selector lever evaluation of selector lever CAN message counter	If the value of message counter is permanent constant or change exceeds a threshold increment an event counter	change of	 No failure of selector lev- er CAN mes- sages Terminal 15 voltage > 7.5 V For more than 500.0 ms 	• 50.0 ms	2 driving cycles

Diagnostic Procedures 3.6

- ◆ ⇒ "3.6.1 Accelerator Pedal Module GX2, Checking", page 1101
- ⇒ "3.6.2 After-Run Coolant Pump V51 , Checking", page 1103
- ⇒ "3.6.3 Camshaft Adjustment Valve 1 N205, Checking", page 1105

- ⇒ "3.6.4 Camshaft Position Sensor G40, Checking", page 1107

- .5 CAN-Bus 1.
 .1109
 3.6 CAN-Bus Terminal Rupage 1112

 i.6.7 Charge Air Pressure Actuator V-1.
 .13

 "3.6.8 Charge Air Pressure Sensor G31, Check...
 age 1115

 > "3.6.9 Engine Coolant Temperature Sensor G62, Checking", page 1117

 ⇒ "3.6.10 Engine Coolant Temperature Sensor On Radiator
 Outlet G83, Checking", page 1147

 ⇒ "3.6.11 Engine Speed Sensor G28, Checking",
 ¬e 1121

 *EVAP Canister Purge Regulator Valve 1 N80.
 ¬e 1123

 **ery Unit GX1 / Fuel Pump Control Module

 **log".
 **page 1127

 **log".
 **ing". page 1127

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- Checking", page 1135
- "3.6 19 Intake Manifold Runner Position Sensor G336, Checking", page 1137
- ⇒ "3.6.20 Intake Manifold Sensor GX9, Checking", page 1139
- ⇒ "3.6.21 Knock Sensor 1 G61, Checking", page 1141
- ⇒ "3.6.22 Leak Detection Pump V144, Checking" page 1143
- Mo Marufindo Sinanto Rathing R ⇒ "3.6.23 Motronic Engine Control Module Power Supply Relay J271, Checking", page 1145
- ⇒ "3.6.24 Outside Air Temperature Sensor G17, Checking", page 1148
- ⇒ "3.6.25 Oxygen Sensor 1 After Catalytic Converter GX7 , Checking", page 1149
- * "3.6.26 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 1152
- ⇒ "3.6.27 Radiator Shutter Motor V544, Checking", page 1155
- ⇒ "3.6.28 Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 1157
- ⇒ "3.6.29 Secondary Air Injection Sensor 1 G609, Checking", page 1159

General Description

Andary Air Injection Sensor 2 G610 , Che.

Secondary Air Injection Solenoid Valve N112 , 1 page 1163

32 Secondary Air System GX24 , Checking", 2 1165

33.6.33 Three Way Catalytic Converter, TWC Checking", page 1169

33.6.34 Throttle Valve Control Module GX3 , Checking page 1169

33.6.35 Turbocharger Recirculation Valve N249 , Check-page 1172

36 Vehicle Speed Signal, Checking", page 1174

Accelerator Pedal Module - GX2-, 9 9 and the Accelerator of the accelerator pedal throughout of the acce the entire adjustment range. The Engine Control Module - J623detects the driver's request from these signals and uses them to calculate the injection quantity and EPC Throttle valve operation.

ponents:

The Accelerator Pedal Module - GX2- components cannot be serviced separately, and they must be serviced as a unit.

Special tools and workshop equipment required

Test requirements

- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.



Step		Procedure	Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 . Was Complaint verified?	 YES: GO TO Step 2 ⇒ page 1102. NO: GATHER more information from customer shout the complaint.
			about the complaint.
2	•	IGNITION: OFF.	YES:◆ Condition may be intermittent.
	•	CONNECT: Scan Tool.	,
	•	IGNITION: ON.	 PERFORM: Visual Inspection of wiring and component.
	•	CHECK: Throttle valve position closed:	◆ CHECK: Wiring for open, high resistance,
	•	SPECIFIED VALUE: 3 – 25%.	short or harness connector for damage, corro sion, loose or broken terminals.
		DEPRESS: Accelerator pedal slowly to WOT while observing the percentage display. The percentage display must increase uniformly.	A DEDAID: Fault codings an account of
			→ OC 10. Step 0 <u>→ page 1100</u> .
		SPECIFIED VALUE: 84 – 97%.	◆ GO TO Step 3 <u>⇒ page 1102</u> .
		IGNITION: OFF.	gen AG. Volkswagen A.C.
	_	Was Value obtained?	doy Volkswages
3	•	DISCONNECT: Accelerator Pedal Module GX2- harness connector.	- YES: ♦ GO TO Step 4 ⇒ page 1102.
		IGNITION: ON.	- NO:
		CHECK: Accelerator Pedal Module - GX2- harness connector terminals 1 to 5 and 2 to 3 for voltage.	
		SPECIFIED VALUE: About 5 0 V.	
		IGNITION: OFF.	
	_	Were Values obtained?	
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	 YES: REPLACE: Accelerator Pedal Module - GX2- Refer to appropriate repair manual.
	•	CHECK: Accelerator Pedal Module - GX2- harness connector terminal 4 to the Engine Control Module - J623- harness connector T91 / 52 for resistance.	r- -
		CHECK: Accelerator Pedal Module - GX2- harness connector terminal 6 to the Engine Control Module - J623- harness connector T91 / 69 for resistance.	component. CHECK: Wiring for open, high resistance,
	•	SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	♦ REPAIR: Faulty wiring or connector.
	-	for resistance. SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$. Were Values obtained?	short or namess connector for damage, corrosion, loose or broken terminals. ♦ REPAIR: Faulty wiring or connector. • GO TO: Step 6 ⇒ page 1103.
			DA negewayin V Vary

Step	Procedure	Result / Action to Take
5	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	 YES: GO TO: Step 6 ⇒ page 1103 .
	 CHECK: Accelerator Pedal Module - GX2- harness connector terminal 1 to the Engine Control Module - J623- harness connector T91 / 16 for resistance. CHECK: Accelerator Pedal Module - GX2- harness connector terminal 2 to the Engine Control Module - J623- harness connector T91 / 33 for resistance. CHECK: Accelerator Pedal Module - GX2- harness connector terminal 3 to the Engine Control Module - J623- harness connector T91 / 34 for resistance. CHECK: Accelerator Pedal Module - GX2- harness connector terminal 5 to the Engine Control Module - J623- harness connector T91 / 51 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). 	 PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 1103.
	– Were Values obtained?	
6	Final ProcedurePerform a road test to verify repair.Does the original DTC return?	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary.
		♦ If all electrical connections are OK:
		◆ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	part orin who original oring the sauthorized by Volkswagen AG. Vol	 Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

After-Run Coolant Pump - V51-, Check-3.6.2 ing

General Description

The After-Run Coolant Pump - V51- is cycled on and off by the Engine Control Module - J623- .

Special tools and workshop equipment required Elifatoo Va betoeloriani

- Multimeter.
- Wiring Diagram.



Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO Step 2 ⇒ page 1104 . NO: GATHER more information from customer
		about the complaint.
2	IGNITION: OFF.DISCONNECT: After-Run Coolant Pump -	 YES: GO TO: Step 3 ⇒ page 1104
	V51- harness connector.IGNITION: ON.	 NO: PERFORM: Visual Inspection of wiring and component.
	 CHECK: After-Run Coolant Pump - V51- harness connector terminal 2 to ground for voltage. SPECIFIED VALUE: Battery voltage. 	 CHECK: Wiring for open, high resistance, short or harness connector for damage, corresion, loose or broken terminals.
	SPECIFIED VALUE: Battery voltage.	REPAIR: Faulty wiring or connector.
	JGNITION: OFF. Was Value obtained?	 REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1105
3thorts	CHECK: After-Run Coolant Pump - V51- har- ness connector terminal 1 to ground for resist-	- YES:
ie, isno	 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 NO: PERFORM: Visual Inspection of wiring and component
	- was value obtained:	CHECK: Wining for open, high resistance, short or harness connector for damage, corresion, loose of broken terminals.
		REPAIR: Faulty wiring or connector.
		♦ GO TO: Step 5 <u>⇒ page 1105</u> .
OHVAR OF COMMIS	 Was Value obtained? CHECK: After-Run Coolant Pump - V51- harness connector terminal 1 to ground for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? Rep. Gr.ST - Generic Scan Tool 	Thomation in the state of the s
	Protected by Copyright, Copyright	BulkdoD turk
1104	Rep. Gr.ST - Generic Scan Tool	

	walkagen AG. Volkswagen AG doo	Generic Scarl 1001 - Edition 12.2017
Step		Result / Action to Take
4	 REMOVE: Engine Control Module - J623 Refer to the appropriate repair manual. CHECK: After-Run Coolant Pump - V51- har- 	→ YES: ◆ REPLACE: After-Run Coolant Pump - V51 Refer to appropriate repair manual.
	ness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 84 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	 ◆ GO TO: Step 5 ⇒ page 1105 . NO: ◆ PERFORM: Visual Inspection of wiring and component.
poses, in part or in who _{le}	– Was Value obtained?	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
in p		♦ REPAIR: Faulty witing or connector.
boses		♦ GO TO: Step 5 <u>⇒ page 1105</u> .
5 Ind bni	Final Procedure Perform a road test to verify repair. Does the original DTC return? Toggethardo indiando indian	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623- Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14 Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		◆ If no DTC's return, the repair is complete.
		Return vehicle to customer.

3.6.3 Camshaft Adjustment Valve 1 - N205-, Checking

General Description

The camshaft's task is to operate the valves at the right time and in the right order to control the charge cycle. Camshaft adjustment using the Camshaft Adjustment Valve 1 - N205- varies the opening times of the valves to suit all operating conditions. This ensures ideal charge cycles within a wide range of engine speeds and loads. Fuel consumption and pollutant emissions are reduced, torque and smoothness increased. In engines with a double overhead camshaft the size and positioning of the valve opening overlap can be influenced, enhancing characteristics in full-load and part-load operation. In continuous camshaft adjustment, the adjustment is infinitely variable within specific parame-

Special tools and workshop equipment required

Multimeter.

- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 - ⇒ "1 Safety Precautions", page 2.
- View clean working conditions:
- ⇒ "102 Clean Working Conditions", page 3.

(V)					
	Jetta/Beetle 2013 ➤ Generic Scan Tool - Edition 12.2017				
◆ Sc Test r • Fu • Ba • Sw • Ve er • Ve po: • Ob • Vie	ring Diagram. an Tool. equirements ses OK. ttery voltage OK. vitch OFF all electrical and electronic accessories. hicles with automatic transmission, ensure the sele position is in "P". hicles with manual transmission, ensure the shifter sition is in "N" with the parking brake applied. serve all safety precautions: 11 Safety Precautions, page 2.				
	2 Clean Working Conditions", page 3 . Procedure	tness of ir			
Step	Procedure	Result / Action to Take			
1	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ 3.1 Preliminary Check", page 13 Was Complaint verified?	 YES: GO TO: Step 2 page 1106. NO: GATHER more information from customer about the complaint. 			
2	 IGNITION: OFF. DISCONNECT: Camshaft Adjustment Valve 1 - N205- harness connector. CHECK: Camshaft Adjustment Valve 1 - N205- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 5 – 20 Ω (+/- 3 Ω @ approx. 20° C). Was Value obtained? 	 YES: WHO OF The Property of the			
3	 IGNITION: ON. CHECK: Camshaft Adjustment Valve 1 - N205-harness connector terminal 1 to ground for voltage. SPECIFIED VALUE: Battery voltage. IGNITION: OFF. Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 1107. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1107. 			

Step	Procedure	Result / Action to Take	
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Camshaft Adjustment Valve 1 - N205-harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 105 for resistance. 	 YES: TIP: The Camshaft Adjustment Valve 1 - N205-may fail under loaded operation; please swap a known good Camshaft Adjustment Valve 1 - N205- prior to continuing to the next step. GO TO: Step 5 ⇒ page 1107. 	
	 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. 	
		 REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1107. 	
5	Final ProcedurePerform a road test to verify repair.Does the original DTC return?	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. 	
		♦ REPAIR: As necessary.	
		 If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. 	
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.	
		 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14 	
	AG. Volkswagen AG does not go	Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's.	
	illi duriess	If no DTC's return, the repair is complete. Return vehicle to customer.	

3.6.4 Camshaft Position Sensor - G40-, Checking

General Description

ico Hay with respect to the correctness of information in the correctness Using the signal from the Camshaft Position Sensor - G40-, the precise position of the camshaft relative to the crankshaft is determined very quickly when the engine is started. Used in combination with the signal from the Engine Speed Sensor - G28-, the signal from the Camshaft Position Sensor - G40- allows the Engine Control Module - J623- to detect which cylinder is at TDC. The fuel can be injected into the corresponding cylinder and ignited:

Special tools and workshop equipment required

Protected by

Olkswagen AG.

- Multimeter.
- Wiring Diagram.

Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3

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◆ Sc	an	Tool.			_		
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	-	s OK.	odb'	Nolkswas Suara			
Baf	tter	ry voltage OK.		**************************************			
Sw	itcl	h OFF all electrical and electronic accessories.		·Copt			
er p	pos	eles with automatic transmission, ensure the select sition is in "P".	ctor	r lev-	lab little		
pos	sitic	eles with manual transmission, ensure the shifter on is in "N" with the parking brake applied.	lev	ver	withresp		
⇒ "· Vie ⇒ "·	'1.1 ew c '1.2	rve all safety precautions: 1 Safety Precautions", page 2 clean working conditions: 2 Clean Working Conditions", page 3 cedure		Result / Action to Take YES: GO TO: Step 2 ⇒ page 1108. NO: GATHER more information from customer about the complaint. YES: YES:	ect to the correctnes		
Step		Procedure		Result / Action to Take	38 Of /		
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified?	- •	YES: GO TO: Step 2 ⇒ page 1108 . NO: GATHER more information from customer about the complaint.	information in this co		
2		IGNITION: OFF.		YES:			
_		DISCONNECT: Camshaft Position Sensor	♦	GO TO: Step 3 ⇒ page 1108 . NO:			
		IGNITION: ON.	•	°GO TO: Step 4 ⇒ page 1109 ≈ N° N° °			
	•	CHECK: Camshaft Position Sensor - G40- harness connector terminals 1 to 3 for voltage.					
	•	IGNITION: OFF.					
	•	SPECIFIED VALUE: About 5.0 V.					
	<u> -</u>	Was Value obtained?	<u> </u>				
3	•	''' '	•	YES: REPLACE: Camshaft Position Sensor - G40 Refer to appropriate repair manual.			
	•	trol Module - J623- harness connector T105 /	_				
		SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).		component.			
	-	Was Value obtained?	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.			
				REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1109.			
		<u> </u>	•	30 10. Step 3 <u>γ page 1100</u> .			

Step		Procedure		Result / Action to Take
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. For 2016 – 2018 Jetta: CHECK: Camshaft Position Sensor - G40- harness connector terminal 1 to the Engine Control Module - J623-harness connector T105 / 69 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/Beetle Convertible: CHECK: Camshaft Position Sensor - G40- harness connector terminal 1 to the Engine Control Module - J623- harness.	- ♦ - ♦	YES: GO TO: Step 5 ⇒ page 1109. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
es, in part or in whole, is hot be.	• 11144.	connector T105 / 48 for resistance. For 2016 – 2018 Jetta: CHECK: Camshaft Position Sensor - G40- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 44 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/ Beetle Convertible: CHECK: Camshaft Position Sensor - G40- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 47 for resistance. SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$.	drante ◆	TGO TO: Step 5 ⇒ page 1109.
or commercial purpos		Were Values obtained? Final Procedure Perform a road test to verify repair. Does the original DTC return?	* * * * * *	YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21 Repair is complete. Generate Readiness Code. Refer to > "3.2 Readiness Code", page 14 Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

CAN-Bus Terminal Resistance, Check-3.6.5 ing

General Description

The Engine Control Module - J623- communicates with other CAN-Bus capable control modules.

The control modules are connected by two data bus wires which are twisted together (CAN_High and CAN_Low), and exchange information (messages). Missing information on the CAN-bus is

recognized as a malfunction by the Engine Control Module - J623and the other control modules connected to the CAN-bus.

Trouble-free operation of the CAN-Bus requires that it have a terminal resistance. This central terminal resistance is located in the Engine Control Module - J623-.

Special tools and workshop equipment required

- ♦ Multimeter.
- ♦ Wiring Diagram.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Test Procedure

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO Step 2 ⇒ page 1110 . NO: GATHER more information from customer
2	 IGNITION: OFF. DISCONNECT: For Jetta (AW0), the Vehicle Electrical System Control Module - J519- harness connector. DISCONNECT: For Jetta (AW1), the Data Bus On Board Diagnostic Interface - J533- harness connector. DISCONNECT: For Beetle, the Data Bus On Board Diagnostic Interface - J533- harness connector. The Engine Control Module - J623- must remain connected for the following step. CHECK: For Jetta (AW0), the Vehicle Electrical System Control Module - J519- harness connector terminals 18 to 19 for resistance. CHECK: For Jetta (AW1) and Beetle, the Data Bus On Board Diagnostic Interface - J533- harness connector terminals 6 to 16 for resistance. SPECIFIED VALUE: 60 – 72 Ω (at approx. 20° C). Was Value obtained? 	 PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO Step 4 ⇒ page 1111 . NO: GO TO Step 3 ⇒ page 1111 .
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1110	Rep. Gr.ST - Generic Scan Tool	A DA NAGEN WAS NOT YOU.

Step		Procedure		Result / Action to Take
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	•	CHECK: For Jetta (AW0), the Vehicle Electrical System Control Module - 3519- harness connector terminal 18 to the Engine Control	*	GO TO Step 4 <u>⇒ page 1111</u> .
		Module - J623- harness connector T91 / 80 for resistance.	•	NO: PERFORM: Visual Inspection of wiring and component.
	•	CHECK: For Jetta (AW0), the Vehicle Electrical System Control Module § J519- harness connector terminal 19 to the Engine Control Module - J623- harness connector T91 / 79 for	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		resistance.	•	REPAIR: Faulty wiring or connector.
	•	CHECK: For Jetta (AW1)/Beetle, the Data Bus On Board Diagnostic Interface J533- harness connector terminal 6 to the Engine Control Module - J623- harness connector T91 / 80 for resistance.	•	GO TO Step 4 ⇒ page 1111 .
	•	CHECK: For Jetta (AW1)/Beetle, the Data Bus On Board Diagnostic Interface - J533- harness connector terminal 16 to the Engine Control Module - J623- harness connector T91 / 79 for resistance. SPECIFIED VALUE: 0.5.0 (± 0.3.0)		DA NO WOLM WORK WAS BEND WOO THE THOUGH OF THE THE THOUGH OF THE THOUGH OF THE THOUGH OF THE THE THO
	•	SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).		. DA nan
	_	Were Values obtained?		
4	•	Final Procedure	-	YES:
	•	Perform a road test to verify repair.	•	CHECK: For Jetta (AW1)/Beetle, the Data Bus On Board Diagnostic Interface - J533- harness
	_	Does the original DTC return?		connector for any damaged, pushed-out pins. For Jetta (AW0), the Vehicle Electrical System Control Module - J519- harness connector for any damaged, pushed-out pins.
			•	REPAIR: As necessary.
			•	If all electrical connections are OK:
			•	REPLACE: For Jetta (AW1)/Beetle, the Data Bus On Board Diagnostic Interface - J533 For Jetta (AW0), the Vehicle Electrical System Control Module - J519 Refer to appropriate repair manual.
			•	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
			•	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14.
			•	Return vehicle to Customer.
			-	NO: Perform the diagnostic procedure for any DTC's.
			•	If no DTC's return, the repair is complete.
			•	Return vehicle to customer.

3.6.6 CAN-Bus Terminal Resistance, Powertrain, Checking

General Description

The Engine Control Module - J623- communicates with all databus capable control modules via a CAN databus.

These databus capable control modules are connected via two data bus wires which are twisted together (CAN_High and CAN_Low), and exchange information (messages). Missing information on the databus is recognized as a malfunction and stored.

Trouble-free operation of the CAN-bus requires that it have a terminal resistance. The central terminal resistor is located in the Engine Control Module - J623- .

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- yolkswagen AG does not guarantee or acceptage. Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step	Procedure	Result / Action to Take
oar Orinwhole, is not	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1112. NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. The Engine Control Module - J623- must remain connected for the following step. The central terminal resistor is located in the Engine Control Module - J623 CHECK: DSG Transmission Mechatronic - J743- harness connector T20e / 15 to T20e / 10 for resistance. SPECIFIED VALUE: 60 – 72 Ω (at approx. 20° C). Was Value obtained? 	 YES: CONDITION May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1113 . NO: GO TO: Step 3 ⇒ page 1113 .

Step		Procedure		Result / Action to Take
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	•	CHECK: CAN bus circuit between the DSG Transmission Mechatronic - J743- harness connector T20e / 15 and the Engine Control	*	GO TO: Step 4 ⇒ page 1113 .
		Module - J623- harness connector T91 / 80 for resistance.	→	NO: PERFORM: Visual Inspection of wiring and component.
	•	CHECK: CAN bus circuit between the DSG Transmission Mechatronic - J743- harness connector T20e / 10 and the Engine Control Module - J623- harness connector T91 / 79 for	♦ KSV	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		resistance.	♦	REPAIR: Faulty wiring or connector.
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	♦	GO TO: Step 4 ⇒ page 1113.
4	-	Were Values obtained? Final Procedure		VEC.
4		Perform a road test to verify repair.	♦	YES: CHECK: DSG Transmission Mechatronic -
	L	De se the emissional DTC well-way		J743- harness connector for any damaged, pushed-out pins.
		w u	♦	REPAIR: As necessary.
		irt or.	♦	If all electrical connections are OK:
		es, in pa	♦	REPLACE: DSG Transmission Mechatronic - J743 Refer to appropriate repair manual.
		cial purpos	•	If all electrical connections are OK: REPLACE: DSG Transmission Mechatronic - J743 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21 .
		or commer	•	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14.
		We The Control of the	•	Return vehicle to Customer.
		Does the original DTC returns to or commercial purposes, in part or in what or in part or in was or commercial purposes, in part or in was or commercial purposes.	-	NO: Perform the diagnostic procedure for any DTC's.
		ndo _O /ng	♦ Þəj;	If no DTC's return, the repair is complete.
			•	Return vehicle to customer.

Charge Air Pressure Actuator - V465-, 3.6.7 Checking

General Description

The Engine Control Module - J623- computes the nominal from the requested torque. If the actual deviates from the nominal, the wastegate* is opened further by the Charge Air Pressure Actuator - V465- (decreases) or closed further (increases). The rapid response of the Charge Air Pressure Actuator - V465- ensures that the wastegate opens quickly in overrun mode, thereby reducing the pumping effort of the turbocharger. The wastegate is closed in the start position. The Charge Air Pressure Actuator - V465- is activated by the PMM signal and the Charge Air Pressure Ac activated by the PWM signal, and the Charge Air Pressure Actuator Position Sensor - G581- provides position feedback.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.

Scan Tool.

Test requirements

- Fuses OK.

- Battery voltage OK.

 Switch OFF all electrical and electronic accessor.

 Vehicles with automatic transmission, ensure the selector lever position is in "P".

 Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied of the position is in "N" with the parking brake applied of the position is in "N" with the parking brake applied of the position is in "Precautions", page 2.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1114. NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Charge Air Pressure Actuator - V465- harness connector. IGNITION: ON. 	 YES: GO TO: Step 3 ⇒ page 1114 . NO: GO TO: Step 4 ⇒ page 1115 .
	 CHECK: Charge Air Pressure Actuator - V465-harness connector terminals 1 to 3 for voltage. SPECIFIED VALUE: About 5.0 V. IGNITION: OFF. Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 1114. NO: GO TO: Step 4 ⇒ page 1115.
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Charge Air Pressure Actuator - V465-harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 88 for resistance. CHECK: Charge Air Pressure Actuator - V465-harness connector terminal 5 to the Engine Control Module - J623- harness connector T105 / 41 for resistance. CHECK: Charge Air Pressure Actuator - V465-harness connector terminal 6 to the Engine Control Module - J623- harness connector T105 / 89 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: REPLACE: Charge Air Pressure Actuator - V465 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1115. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1115.

Step	Procedure	Result / Action to Take
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. For 2016 – 2018 Jetta: CHECK: Charge Air Pressure Actuator - V465- harness connector terminal 1 to the Engine Control Module - J623-harness connector T105 / 61 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/Beetle Convertible: CHECK: Charge Air Pressure Actuator - V465- harness connector terminal 1 to the Engine Control Module - J623-harness connector T105 / 35 for resistance. For 2016 – 2018 Jetta: CHECK: Charge Air Pressure Actuator - V465- harness connector terminal 3 to the Engine Control Module - J623-harness connector T105 / 20 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/Beetle Convertible: CHECK: Charge Air Pressure Actuator - V465- harness connector terminal 3 to the Engine Control Module - J623-harness connector T105 / 33 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω) Were Values obtained? 	 YES: GO TO: Step 5 ⇒ page 1115. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1115.
5	• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω)	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. It all electrical connections are OK: REPLACE: Engine Control Module - J623- Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's.
		◆ If no DTC's return, the repair is complete.

Charge Air Pressure Sensor - G31-, 3.6.8 Checking

General Description

The Charge Air Pressure Sensor - G31- is located in the inlet to the intake manifold. The Engine Control Module - J623- uses the sensor signal to regulate the turbo boost. There is no substitute function in the event of signal failure. If charge air pressure monitoring is about effective and the event of signal data are in interest. itoring is shut off, this may lead to a significant reduction in engine output.

Special tools and workshop equipment required

- ♦ Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- · Fuses OK.
- Battery voltage OK.
- · Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 3

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1116 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Charge Air Pressure Sensor G31- harness connector. IGNITION: ON. CHECK: Charge Air Pressure Sensor - G31- harness connector terminals 1 to 3 for voltage. SPECIFIED VALUE: About 5.0 V. IGNITION: OFF. Was Value obtained? 	- YES: ◆ GO TO: Step 3 ⇒ page 1116 . - NO: ◆ GO TO: Step 4 ⇒ page 1117 .
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Charge Air Pressure Sensor - G31- harness connector terminal 4 to the Engine Control Module - J623- harness connector T91 / 55 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: REPLACE: Charge Air Pressure Sensor - G31 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1117. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1117.
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Step	Procedure	Result / Action to Take			
4	REMOVE: Engine Control Module - J623	- YES:			
	Refer to appropriate repair manual.	◆ GO TO: Step 5 <u>⇒ page 1117</u> .			
	 CHECK: Charge Air Pressure Sensor - G31- harness connector terminal 1 to the Engine Control Module - J623- harness connector T91 / 35 for resistance. 	 NO: PERFORM: Visual Inspection of wiring and component. 			
	CHECK: Charge Air Pressure Sensor - G31- harness connector terminal 3 to the Engine Control Module - J623- harness connector	◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.			
	T91 / 32 for resistance.	REPAIR: Faulty wiring or connector.			
	• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	◆ GO TO: Step 5 <u>⇒ page 1117</u> .			
	– Were Values obtained?				
5	Final Procedure	YES:◆ CHECK: Engine Control Module - J623- har-			
	 Perform a road test to verify repair. 	ness connector for any damaged, pushed-out			
	– Does the original DTC return?	pins.			
		REPAIR: As necessary.			
		♦ If all electrical connections are OK:			
		REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.			
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.			
		◆ Repair is complete. Generate Readiness Code. Refer to			
		⇒ 3.2 Readiness Code , page 14 .			
	_{wewagen} AG. Volk	Wagen AG does			
	holisedbyVolke	Code. Refer to ⇒ "3.2 Readiness Code", page 14 A Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.			
	le se autili	♦ If no DTC's return, the repair is complete.			
	ike dirir	Return vehicle to customer.			
3.6.9 Engine Coolant Temperature Sensor - G62, Checking					
General Description The Engine Coolant Temperature Sensor - G62- sends information about the current coolant temperature to the Engine Control Module - J623 It uses the coolant temperature as a correction value for calculating the injection quantity.					
Specia	Special tools and workshop equipment required				
♦ Mu	ltimeter.	matio			
♦ Wir	ing Diagram.	n in in the second			
♦ Sca	♦ Scan Tool.				
Test re	Test requirements				
• Fus	ses OK.	Copyrdo			
• Bat	 ◆ Wiring Diagram. ◆ Scan Tool. Test requirements • Fuses OK. • Battery voltage OK. 				
3. Diagnosis and Testing 111					

Engine Coolant Temperature Sensor -3.6.9 G62-, Checking

General Description

Special tools and workshop equipment required

- Multimeter.
- ♦ Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Probobod by Age Washing On Williams on Maring to Principle of the Copyright of the Copyrigh Battery voltage OK.



- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3 .

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1118 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Engine Coolant Temperature Sensor - G62- harness connector. CHECK: Engine Coolant Temperature Sensor G62- component connector terminals 1 to 2 of for resistance. SPECIFIED VALUE: 2,250 Ω (+/- 750 Ω @ approx. 20° C). GIGNITION: OFF. Was Value obtained? 	◆ GO TO: Step 4 ⇒ page 1119 .
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Engine Coolant Temperature Sensor - G62- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 47 for resistance. CHECK: Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 40 for resistance SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	ature Sensor - G62- prior to continuing to the next step. ◆ GO TO: Step 4 ⇒ page 1119. - NO:

Step		Procedure		Result / Action to Take	
4	•	Final Procedure Perform a road test to verify repair. Does the original DTC return?	•	YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.	
		Boco the original BTO retain.	♦	REPAIR: As necessary.	
			♦	If all electrical connections are OK:	
			♦	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.	
		ass authorised by V	♦	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21	
		poses, in part or in whole, is now in part or in whole is now in part or in part or in whole is now in part or in part	•	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14 . Return vehicle to Customer.	
		Sish	•	Return vehicle to Customer.	
		rinwhole	-	NO: Perform the diagnostic procedure for any DTC's.).
		art o	♦	If no DTC's return, the repair is complete.	the c
		s, in p	♦	Return vehicle to customer.	orrec
3.6.10 Engine Coolant Temperature Sensor On Radiator Outlet - G83- , Checking					0000 0000 0000 0000 0000 0000 0000 0000 0000
General Description The Engine Coolant Temperature Sensor On Radiator Outlet - G83- sends information about the current coolant temperature to the Engine Control Module - J623 It uses the coolant tempera-					
	ure as a correction value for calculating the injection quantity.				
•	Special tools and workshop equipment required Multimeter. Multimeter. Multimeter. Multimeter. Multimeter.				
 Multimeter. Wiring Diagram. 					
◆ Scan Tool.					
Test requirements • Fuses OK.					
i uded Oix.					

Engine Coolant Temperature Sensor 3.6.10 On Radiator Outlet - G83-, Checking

General Description

Special tools and workshop equipment required

- ♦ Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3

 PERFORM: Preliminary Check to verify the customers complaint. Refer to 2 3.1 Preliminary Check page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector. CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 2,250 Ω (+/- 750 Ω @ approx. 20° C). Was Value obtained? REMOVE: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector terminal 1 to the Engine Control Module - J623- harness connector T91 / 49 for resistance. CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector terminal 2 to the Engine Control Module - J623- harness connector T91 / 29 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was value obtained? Was value obtained? Was value obtained? Was value obtained? CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector terminal 2 to the Engine Control Module - J623- harness connector T91 / 29 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was value obtained? Was value obtained? CHECK: Wiring for open, high resistance. short or harness connector for damage, corrosion, loose or broken terminals. REPARR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1121.
 Was Complaint verified? GATHER more information from customer about the complaint. IGNITION: OFF. DISCONNECT: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector. CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 2,250 Ω (+/- 750 Ω @ approx. 20° C). Was Value obtained? REMOVE: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector terminal 1 to the Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- prior to continuing to the next stap.
 DISCONNECT: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector. CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 2,250 Ω (+/- 750 Ω @ approx. 20° C). Was Value obtained? REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- prior to continuing to the next state.
CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- may fail under loaded operation; please swap a known good Engine Coolant Temperature S
 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was value obtained? CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1121.

Step	Procedure	Result / Action to Take
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
	oring 118 119 1940	♦ REPAIR: As necessary.
	in part	♦ If all electrical connections are OK:
	i, 'Sasso'	♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	mercial pur	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
	ophiliptor purposes, in g	 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14
	To to to	Return vehicle to Customer.
	THAIS ?	NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete.
		Return vehicle to customer.

3.6.11 Engine Speed Sensor - G28-, Checking

General Description

The Engine Speed Sensor - G28- detects rpm and reference marks from a toothed wheel on the crankshaft. Without an engine speed signal, the engine will not start. If the engine speed signal fails while the engine is running, the engine will stop immediately.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step	Procedure NOIKSWagen AG. Volksw	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: ◆ GO TO: Step 2 page 1122 . NO: ◆ GATHER more information from customer about the complaint.
2	 IGNITION OFF. CONNECT: Scan Tool. START or CRANK: Engine. CHECK: Engine rpm. SPECIFIED VALUE: Cranking or Idle rpm. IGNITION: OFF. Was Value obtained? 	 YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Harness for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1123. NO: GO TO: Step 3 ⇒ page 1122.
3	 DISCONNECT: Engine Speed Sensor - G28-harness connector. REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Engine Speed Sensor - G28- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 35 for resistance. CHECK: Engine Speed Sensor - G28- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 70 for resistance. For 2016 – 2018 Jetta: CHECK: Engine Speed Sensor - G28- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 77 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/ Beetle Convertible: CHECK: Engine Speed Sensor - G28- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 33 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). 	 YES: REMOVE: Engine Speed Sensor - G28 Refer to appropriate repair manual. CHECK: Engine Speed Sensor - G28- sensor wheel for proper seating, damage and/or runout. Refer to appropriate repair manual. Sensor wheel OK. REPLACE: Engine Speed Sensor - G28 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 1123 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1123 .
	– Were Values obtained?	

Step	Procedure	Result / Action to Take
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623- Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21 Repair is complete. Generate Readiness
		If no DTC's return, the repair is complete.
The E\ takes p ister Pr Contro Specia Mul Wir Sca Test re Bat Swi Ver er p	Al Description VAP system is designed so the admission of fuel very place only at idle and at light part-throttle. The EVA urge Regulator Valve 1 - N80- is activated by the lost Module - J623- to accomplish this task. Al tools and workshop equipment required Itimeter. It	AP Can- Engine The correctness of information in the correctness of the correctness o
pos • Obs	nicles with manual transmission, ensure the shifter sition is in "N" with the parking brake applied. serve all safety precautions: 1.1 Safety Precautions", page 2 w clean working conditions: 1.2 Clean Working Conditions", page 3	JAN 1988 WEAN VOLKEWAGON TO THOM TO THE MENT OF THE ME
		3. Diagnosis and Testing 112

3.6.12

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagrams
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P"
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions:

 ⇒ "1.2 Clean Working Conditions", page 3 Project Conditions (Conditions), page 3 Project Cond



Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1124 . NO: GATHER more information from customer about the complaint.
2	 DISCONNECT: EVAP Canister Purge Regulator Valve 1 - N80- harness connector. CHECK: EVAP Canister Purge Regulator Valve 1 - N80- component connector terminals 1 to 2 for resistance. 	 YES: GO TO: Step 3 ⇒ page 1124 . NO: REPLACE: EVAP Canister Purge Regulator Valve 1 - N80 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1125 .
3	 IGNITION: ON. CHECK: EVAP Canister Purge Regulator Valve 1 - N80- harness connector terminal 1 to ground for voltage. SPECIFIED VALUE: Battery voltage. IGNITION: OFF. Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 1124. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. Tools not guarantee. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1125.
4	I SPECIFIED VALUE: 0.5.0 (+ 0.3.0)	 REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1125 . YES: TIP: The EVAP Canister Purge Regulator Valve 1 - N80- may fail under loaded operation; please swap a known good EVAP Canister Purge Regulator Valve 1 - N80- prior to continuing to the next step. GO TO: Step 5 ⇒ page 1125 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1125 .
112	- Was Value obtained?	A STAND WHEN THE WAS DEN AG. Protected by Copyright Of the Washing Copyright Of the Washing Copyright Of the Washing Copyright Of the Washington of the Wash

_	Nakswagen Ad. Vallandyen AG.	Cloes not
Step	Procedure	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary.
	logs	♦ If all electrical connections are OK:
	ir whole,	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	s, inpart or in whole, is not bey	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21
	al purpose	◆ Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14.
	merci	Return vehicle to Customer.
	Ophinale of commercial purposes, in	 NO: ◆ Perform the diagnostic procedure for any DTC's.
	The state of the s	◆ If no DTC's return, the repair is complete.
	Juli Coo Juli	Return vehicle to customer.
	3 Fuel Delivery Unit - GX1- / Fuel P	SON SHO V VOTADIA
3.6.1	3 Fuel Delivery Unit - GX1- / Fuel P	ıımn

rotected by copyrior Fuel Delivery Unit - GX1- / Fuel Pump 3.6.13 Control Module - J538-, Testing

General Description

The Engine Control Module - J623- tells the Fuel Pump Control Module - J538- the demand needed for fuel volume and pressure and activates the Transfer Fuel Pump - G6-. The Transfer Fuel Pump - G6- transfers fuel to the rest of the fuel system, where it is monitored by the Engine Control Module - J623- through sensors, and controlled through regulators and/or metering valves.

Note the Transfer Fuel Pump - G6- is also known as the Fuel Delivery Unit - GX1-.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.



View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3 .

Test Procedure



Note

When the door is opened or the Ignition is turned to the ON position the fuel pump is activated for 2 seconds to build up the pressure in the fuel system.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? AG. Volkswagen AG does to Volkswagen AG does t	- YES: ◆ GO TO: Step 2 ⇒ page 1126 . - NO: ◆ GATHER more information from customer about the complaint. - YES: - YES:
ses, in part or in w.z.	 LISTEN: Fuel Delivery Unit - GX1- should be heard running for 2 s. IGNITION: OFF. SPECIFIED VALUE: Transfer Fuel Pump ON for 2 s. Was Value obtained? 	 Condition may be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 1127. NO: GO TO: Step 3 ⇒ page 1126.
3 odnove:	 DISCONNECT: Fuel Pump Control Module - J538- harness connector. IGNITION: ON. CHECK: Fuel Pump Control Module - J538- harness connector terminals 1 and 3 to 6 for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage - Were Values obtained? RECONNECT: Fuel Pump Control Module - J538- harness connector. DISCONNECT: Fuel Delivery Unit - GX1- harness connector. CRANK: Engine. CHECK: Fuel Delivery Unit - GX1- harness connector terminals 1 to 5 for voltage while engine is cranking. IGNITION: OFF. SPECIFIED VALUE: 7 – 11 V. Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 1126. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 1127. YES: REPLACE: Fuel Delivery Unit - GX1-, Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 1127. NO: GO TO: Step 5 ⇒ page 1127.

Step	Procedure	Result / Action to Take
5	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. DISCONNECT: Fuel Pump Control Module - J538- harness connector Control Module - J538- harness connector terminal 2 to Engine Control Module - J623- harness connector T91 / 9 for resistance SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained?	 YES:
6	- 4 E	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623- Refer to appropriate repair manual. Clear the DTC's. Refer to 3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21 Repair is complete. Generate Readiness Code. Refer to 3.2 Readiness Code", page 14 Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

Fuel Injectors, Checking 3.6.14

General Description

The Fuel Injectors are controlled by the Engine Control Module - J623- and are mounted normally in the cylinder head. The fuel injectors spray high-pressure atomized fuel directly into the combustion observer. bustion chamber.

Special tools and workshop equipment required

- Multimeter.
- ♦ Wiring Diagram.
- ♦ Scan Tool.
- ♦ LED Test Lamp.

Test requirements

· Fuses OK.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1128 . NO: GATHER more information from customer about the complaint.
2	 IGNITION OFF. DISCONNECT: Harness connector from suspect Fuel Injector. CHECK: Suspect Fuel Injector component connector terminals 1 to 2 for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). SPECIFIED VALUE: 0.5 – 15 Ω (@ approx. 20° C). Was Value obtained? 	◆ GO TO: Step 4 <u>⇒ page 1129</u> .
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Suspect Fuel Injector harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / xx for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). CHECK: Suspect Fuel Injector harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / xx for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: TIP: The Fuel Injector may fail under loaded operation; please swap a known good Fuel Injector prior to continuing to the next step. GO TO: Step 4 ⇒ page 1129 . NO: PERFORM: Visual Inspection of wiring and component.

		36	Sen all all all all all all all all all al
Step		Procedure authorn	Result / Action to Take
4	•	Final Procedure	- YES:
	•	Perform a road test to verify repair.	◆ CHECK: Engine Control Module - J623- har- ness connector for any damaged, pushed-out
	-	Does the original DTC return?	pins.
		is,	♦ REPAIR: As necessary.
		vhoJe,	♦ If all electrical connections are OK:
		ut orin v	♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		Does the original DTC return? Does the original DTC return? Does the original DTC return?	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
		nercial pur	 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14
		mos	◆ Return vehicle to Customer.
		to alentida de la companya della companya della companya de la companya della com	 NO: ◆ Perform the diagnostic procedure for any DTC's.
		Sundo	♦ If no DTC's return, the repair is complete.
		146	Return vehicle to customer.
			Protected by Vov.

Fuel Pressure Regulator Valve - N276-, 3.6.15 Checking

General Description

The Engine Control Module - J623- regulates the Fuel Pressure Regulator Valve - N276- directly at the high pressure fuel pump to control the low pressure valve inside the high pressure fuel pump.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1130 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Fuel Pressure Regulator Valve - N276- harness connector. CHECK: Fuel Pressure Regulator Valve - N276- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 1.5 – 11 (± 0.5) Ω (@ approx. 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 1130 . NO: REPLACE: Fuel Pressure Regulator Valve - N276 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1131 .
3	 IGNITION: ON. For 2016 – 2018 Jetta: CHECK: Fuel Pressure Regulator Valve - N276- harness connector terminal 1 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 1130. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1131.
4	 REMOVE: Engine Control Module J623 Refer to appropriate repair manual. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/ Beetle Convertible: CHECK: Fuel Pressure Regulator Valve - N276- harness connector terminal 1 to the Engine Control Module - J623-harness connector T105 / 93 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/ Beetle Convertible: CHECK: Fuel Pressure Regulator Valve - N276- harness connector terminal 2 to the Engine Control Module - J623-harness connector T105 / 92 for resistance. For 2016 – 2018 Jetta: CHECK: Fuel Pressure Regulator Valve - N276- harness connector terminal 2 to the Engine Control Module - J623-harness connector T60 / 45 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). 	 GO TO: Step 5 ⇒ page 4131. NO: PERFORM: Visual Inspection of Wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	- Was Value obtained?	

Step	Procedure		Result / Action to Take	
5	Final Procedure Perform a road to Does the original	test to verify repair.	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. ◆ REPAIR: As necessary. 	
			If all electrical connections are OK:	
			♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.	
			◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.	
			 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14 	
			Return vehicle to Customer.	
			NO:◆ Perform the diagnostic procedure for any DTC's.	
			◆ If no DTC's return, the repair is complete.	
			Return vehicle to customer.	
Volkswagen AG. Volkswagen AG does not				
3.6.1	 Return vehicle to customer. 3.6.16 Fuel Pressure Sensor - G247 - , Checking General Description 			
Gener	General Description			
The Fi	The Fuel Pressure Sensor - G247- measures the fuel pressure in			

3.6.16

General Description

And the correctness of information informa The Fuel Pressure Sensor - G247- measures the fuel pressure in the high-pressure fuel system. The Engine Control Module - J623analyzes the signal and regulates the fuel high pressure through the Fuel Pressure Regulator Valve - N276- in the high-pressure pump.

Special tools and workshop equipment required

- ♦ Multimeter
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Protectedb Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3

Teet D	rocedure	Volkswagen AG. Volkswagen AG does not gue
Step		Result / Action to Take
1	Procedure • PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 - Was Complaint verified?	 YES: GO TO: Step 2 ⇒ page 1132 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Fuel Pressure Sensor - G247-harness connector. IGNITION: ON. CHECK: Fuel Pressure Sensor - G247- harness connector terminals 1 to 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: About 5.0 V. 	 YES: GO TO: Step 3 ⇒ page 1132. NO: GO TO: Step 4 ⇒ page 1132.
3	 Was Value obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Fuel Pressure Sensor - G247 harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 49 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: REPLACE: Fuel Pressure Sensor - G247 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1133. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1133.
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/ Beetle Convertible: CHECK: Fuel Pressure Sensor - G247- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 33 for resistance. For 2016 – 2018 Jetta: CHECK: Fuel Pressure Sensor - G247- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 11 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/ Beetle Convertible: CHECK: Fuel Pressure Sensor - G247- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 35 for resistance. For 2016 – 2018 Jetta: CHECK: Fuel Pressure Sensor - G247- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 68 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1133 .

Step	Procedure moiseaux	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	YES: CHECK: Engine Control Module 2,1623- harness connector for any damaged, pushed-out pins.
	, jours,	♦ REPAIR: As necessary.
)O/G	♦ If all electrical connections are OK:
	orin wi	REPLACE: Engine Control Module - J623. Refer to appropriate repair manual.
	Does the original production in part or in whole is a part or in which it is a part or in which i	 Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21 . Repair is complete. Generate Readiness
	ercial purpo	 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14 Return vehicle to Customer.
	Jumes	♦ Return vehicle to Customer.
	o to all the state of the state	 NO: ◆ Perform the diagnostic procedure for any DTC's.
	J. Dura	♦ If no DTC's return,the repair is complete.
	145May	Return vehicle to customer, the Return vehicle to customer vehicle to
	Polied by Copy	BOID : DA NSURURANO V

3.6.17 Ignition Coils With Power Output Stage, Checking

General Description

The ignition coil must transform the relatively low 12 V on-board vehicle voltage to the high ignition voltage required and supply the energy stored in that voltage to the spark plug. The functional principle of the ignition coil is relatively simple. It has a primary winding (small number of turns) and a secondary winding (lots of turns). The turn ratio between the number of primary and secondary winding turns determines the level of the voltage generated at the output. The Ignition Coils With Power Output Stage are plugged directly into the spark plug. This means the ignition energy can be transferred directly to the spark plug with virtually zero power loss.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.
- ◆ LED Test Lamp.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.

- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 3

Step	Procedure			Result / Action to Take		
— <u> </u>	_			0		
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to "3.1 Preliminary Check", page 13. Was Complaint verified?	- •	YES: GO TO: Step 2 ⇒ page 1134. NO: GATHER more information from customer about the complaint.		
2		IGNITION: OFF. DISCONNECT: Suspect Ignition Coil With Power Output Stage harness connector. IGNITION: ON. CHECK: Suspect Ignition Coil With Power Output Stage harness connector terminals 4 to 1 and 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained?	-	YES: GO TO: Step 3 ⇒ page 134. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for opens, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1135.		
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Suspect Ignition Coil With Power Output Stage harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / xx for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$. Was Value obtained?	*	YES: GO TO: Step 4 ⇒ page 1134. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1135.		
4	•	DISCONNECT: All of the Fuel Injectors . Refer to appropriate wiring diagram. DISCONNECT: Cold Start Injector (If applicable). CONNECT: Engine Control Module - J623-harness connector. CONNECT: LED Test Lamp to Suspect Ignition Coil With Power Output Stage harness connector terminals 2 to 3. CRANK: Engine. SPECIFIED VALUE: LED Test Lamp should Flicker ON & OFF. Was Value obtained?	* -	YES: REPLACE: Ignition Coil With Power Output Stage . Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1135 . NO: GO TO: Step 5 ⇒ page 1135 .		

Step	Procedure	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		◆ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
		 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14
		Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		♦ If no DTC's return, the repair is complete.
	Lolkswagen	Return vehicle to customer.

Intake Manifold Runner Control Valve -3.6.18 N316-, Checking

General Description

The intake manifold runner valve(s) are mounted on a common shaft and actuated by a vacuum cell. The partial vacuum required for actuation is supplied by the Intake Manifold Runner Control Valve - N316- . The Engine Control Module - J623- activates the Intake Manifold Runner Control Valve - N316- on the basis of a characteristic map.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.



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Step	Procedure	Result / Action to Take	
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1136 . NO: GATHER more information from customer about the complaint. 	
3	 IGNITION: OFF. DISCONNECT: Intake Manifold Runner Control Valve - N316- harness connector. CHECK: Intake Manifold Runner Control Valve - N316- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 5 – 35 Ω (@ approx. 20° C). Was Value obtained? IGNITION: ON. CHECK: Intake Manifold Runner Control Valve - N316- harness connector terminal 1 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 1136. NO: REPLACE: Intake Manifold Runner Control Valve - N316 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1137. YES: GO TO: Step 4 ⇒ page 1136. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. 	
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Intake Manifold Runner Control Valve - N316- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 53 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 GO TO: Step 5 ⇒ page 1137. YES: TIP: The Intake Manifold Runner Control Valve - N316- may fail under loaded operation; please swap a known good Intake Manifold Runner Control Valve - N316- prior to continuing to the next step. GO TO: Step 5 ⇒ page 1137. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1137. 	

Step	Procedure	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
		 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14
		♦ Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		♦ If no DTC's return, the repair is complete.
		Return vehicle to customer.

3.6.19 Intake Manifold Runner Position Sensor - G336-, Checking

The Intake Manifold Runner Position Sensor - G336- provides the Engine Control Module - J623- with the position of the intake manifold runner flaps. The Engine Control Module - J623- can volkswagen AG does not then use actuators to adjust these flaps to be open of closed in order to provide longer or shorter intake runners depending on available at the time plus, depending on efficiency.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3. 146MOD 1945



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Step		Procedure "wwagen AG."	/olk	swagen AG d Result / Action to Take
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified?		YES: GO TO: Step 2 ⇒ page 1138. NO: GATHER more information from customer about the complaint.
3	•	IGNITION: OFF DISCONNECT: Intake Manifold Runner Position Sensor - G336- harness connector. IGNITION: ON. CHECK: Intake Manifold Runner Position Sensor - G336- harness connector terminals 1 to 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: About 5.0 V. Was Value obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Intake Manifold Runner Position Sensor - G336- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 36 for resistance.		YES: GO TO: Step 3 ⇒ page 1138. NO: GO TO: Step 4 ⇒ page 1138. YES: REPLACE: Intake Manifold Runner Position Sensor - G336 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1139.
	-	nector T105 / 36 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained?		PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 page 1139.
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Intake Manifold Runner Position Sensor - G336- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 48 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/ Beetle Convertible: CHECK: Intake Manifold Runner Position Sensor - G336- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 47 for resistance. For 2016 – 2018 Jetta: CHECK: Intake Mani-	* * *	YES: GO TO: Step 5 ⇒ page 1139. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1139.
	•	fold Runner Position Sensor - G336- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 27 for resistance. SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$. Were Values obtained?		

Step	Procedure	Result / Action to Take
5		 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
		 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14
		◆ Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		◆ If no DTC's return, the repair is complete.
		Return vehicle to customer.

3.6.20 Intake Manifold Sensor - GX9-, Check-

General Description

The air mass and are two factors used for engine load management. For this purpose, there are several sensors with absolutely contains. They measure the intake air temperature and The first sender unit is located upthe intake manifold pressure. The first sender unit is located upstream of the Throttle Valve Control Module - J338/GX3- in the Intake Manifold Sensor - GX9-. They measure the pressure and temperature of the air in each individual cylinder bank. The values measured here correspond to the actual air mass in the cylinder bank(s).

The Intake Manifold Sensor - GX9- contains the following components:

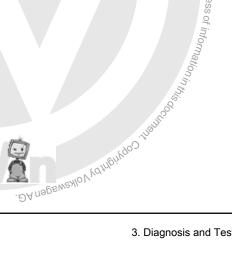
- Intake Air Temperature Sensor G42- .
- Manifold Absolute Pressure Sensor G71- .

The Intake Manifold Sensor - GX9- components cannot be serviced separately, and they must be serviced as a unit.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.



- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3 .

1	•	PERFORM: Preliminary Check to verify the	- YES:
	_	customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified?	 GO TO: Step 2 ⇒ page 1140 . NO: NO: GATHER more information from customer about the complaint.
2	•	IGNITION: OFF. DISCONNECT: Intake Manifold Sensor - GX9-harness connector. IGNITION: ON. CHECK: Intake Manifold Sensor - GX9- harness connector terminals 1 to 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: About 5.0 V.	 YES: GO TO: Step 3 ⇒ page 1140. NO: GO TO: Step 4 ⇒ page 1141.
3	•	Was Value obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Intake Manifold Sensor - GX9- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 51 for resistance. CHECK: Intake Manifold Sensor - GX9- harness connector terminal 4 to the Engine Control Module - J623- harness connector T105 / 52 for resistance. SPECIFIED VALUE: 0.5Ω ($\pm 0.3 \Omega$) Were Values obtained?	 YES: REPLACE Intake Manifold Sensor - GX9 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1141 NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1141.
114	<u> </u>	Rep. Gr.ST - Generic Scan Tool	Correctness of Information in the Market of I

Step		Procedure		Result / Action to Take
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.		YES: GO TO: Step 5 ⇒ page 1141 .
	•	CHECK: Intake Manifold Sensor - GX9- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 33 for resistance. For 2013 – 2015 Jetta, 2013 – 2016 Beetle/ Beetle Convertible: CHECK: Intake Manifold Sensor - GX9- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 48 for resistance. For 2016 – 2018 Jetta: CHECK: Intake Manifold Sensor - GX9- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 42 for resistance. SPECIFIED VALUE: 0.5 Ω (\pm 0.3 Ω). Were Values obtained?	*	NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1141.
5	• • –	Final Procedure Perform a foad test to verify repair. Does the original DTC return?	• • •	YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21 Repair is complete. Generate Readiness Code. Refer to "3.2 Readiness Code", page 14 Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

Knock Sensor 1 - G61-, Checking 3.6.21

General Description

The Knock Sensor 1 - G61- is a tuned accelerometer on the engine which converts engine vibration to an electrical signal. The Engine Control Module - J623- uses this signal to determine the presence of engine knock and to retard spark timing, if necessary.

Special tools and workshop equipment required

- ♦ Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Test Procedure



Note

- Prior to beginning the test procedure, make sure to check the items listed below:
- Poor fuel quality
- Ignition timing malfunction
- Loose components on the engine block
- Engine temperature must be in the normal range

Step		Procedure		Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13.	_ ♦ 1 <u>a</u> g(YES: GO TO: Step 2 ⇒ page 1142 . PAG. Volkswagen AG does no.
	_	⇒ "3.1 Preliminary Check", page 13 . Was Complaint verified?	•	GATHER more information from customer about the complaint.
2	· •	IGNITION: OFF. CONNECT: Scan tool .	-	YES: Condition may be intermittent.
		START: Engine and let lule.	•	PERFORM: Visual Inspection of wiring and component.
		CHECK: The ignition advance timing value. TAP: Near the Knock Sensor 1 - G61- area and	*	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		monitor for any fluctuations in the ignition timing advance value.	*	REPAIR: Faulty wiring or connector.
	•	IGNITION: OFF.	*	GO TO: Step 4 <u>⇒ page 1143</u> .
	•	SPECIFIED VALUE 1 – 10 degrees of ignition timing fluctuation.	_ ◆	sion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1143. NO: GO TO: Step 3 ⇒ page 1143.
	_	Was Value obtained		s of i
		Rep. Gr.ST - Generic Scan Tool	o de composição	DA 119 DA 119 WED WED WED WED ON THE WAY OF WAS DEN AND WED WAS DEN AND WAS DE
114	2	Rep. Gr.ST - Generic Scan Tool		<u> </u>

Step	Procedure	Result / Action to Take
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Knock Sensor 1 - G61- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 98 for resistance. CHECK: Knock Sensor 1 - G61- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 97 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	
		♦ GO TO: Step 4 <u>⇒ page 1143</u> .
4	Final ProcedurePerform a road test to verify repair.Does the original DTC return?	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. ◆ REPAIR: As necessary.
		 If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	_{Eauthorised by}	◆ Clear the DTC's. Refer to
	oring the seappy of the seappy	 Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

Leak Detection Pump - V144-, Check-3.6.22 ing

General Description

Whenever the engine is running, vacuum is applied to the Vac-uum Switch. This switch applies vacuum to the Upper Chamber of the pump when it receives a ground signal from the Engine Control Module - J623- . This signal is a duty cycle pulse of approximately 40%. When vacuum is applied to the Upper Chamber, fresh air flows in through the One-way Inlet Valve, compressing the spring above the diaphragm. When the Diaphragm begins to rise, the Reed Switch, attached to the Diaphragm Rod, opens. When the Vacuum Switch closes, the vacuum in the Upper Chamber is released. As a result, the spring pushes the Diaphragm down. As the Diaphragm is pushed down the air in the Lower Chamber is pushed out of the One-way Outlet Valve into the EVAP system. This process continues until the pressure in the EVAP system no longer allows the spring to push



agm down.
certain perioc.
Reed Switch closing.
Nowest point. When the
Rethe LDP to build up syst.
es the time it takes for the Ree.
etection Pump - V144- has stoppe.
Is a leak in the system. The slower trice he pump stops running, the less air is leak.
System.

cial tools and workshop equipment required

Multimeter.

Wiring Diagram.
Scan Tool.

Trical and electronic accessories.

Tansmission, ensure the selector leving applied.

Tansmission, ensure the shifter lever
applied. the Diaphragm down. With tension on the Diaphragm, the ECM waits for a certain period of time to watch for the Diaphragm to fall. The Reed Switch closing signals that the Diaphragm has fallen to its lowest point. When the Reed Switch closes, the ECM may cycle the LDP to build up system pressure again. The ECM measures the time it takes for the Reed Switch to close once the Leak Detection Pump - V144- has stopped running to determine if there is a leak in the system. The slower the Diaphragm falls after the pump stops running, the less air is leaking out of the EVAP system.

Special tools and workshop equipment required

Test requirements

Step	Procedure	Result / Action to Take
1	PERFORM: Preliminary Check to verify the customers complaint. Refer to 3.1 Preliminary Check", page 13. Was Complaint verified?	 YES: GO TO: Step 2 ⇒ page 1144 . NO: SATHER more information from customer about the complaint.
2	REMOVE: Evaporative Canister. Refer to appropriate repair manual.	 YES: GO TO: Step 3 ⇒ page 1144 .
	 Plug or Cap off the Leak Detection Pump - V144- hose going to the vent filter. 	NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual.
	 CONNECT: Hand vacuum pump to the Leak Detection Pump - V144- and apply 0.700 bar and see if the vacuum holds. 	fer to appropriate repair manual. ◆ GO TO: Step 5 <u>⇒ page 1145</u> .
	– Did the vacuum hold?	
3	IGNITION: OFF.	 YES: O TO: Step 4 ⇒ page 1145
	 DISCONNECT: Leak Detection Pump - V144- harness connector. 	 NO: PERFORM: Visual Inspection of wiring and
	IGNITION: ON.	component.
	 CHECK: Leak Detection Pump - V144- har- ness connector terminal 4 to ground for volt- age. 	♦ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	IGNITION: OFF.	◆ REPAIR: Faulty wiring or connector.
	SPECIFIED VALUE: Battery voltage.	♦ GO TO: Step 5 <u>⇒ page 1145</u> .
	– Was Value obtained?	

100				``&
Step		Procedure		Result / Action to Take
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual.
	•	CHECK: Leak Detection Pump - V144- harness connector terminal 1 to the Engine Control Module - J623- harness connector T91 / 78 for resistance.	*	GO TO: Step 5 <u>⇒ page 1145</u> . NO:
		CHECK: Leak Detection Pump - V144- har-	•	PERFORM: Visual Inspection of wiring and component.
		ness connector terminal 2 to the Engine Control Module - J623- harness connector T91 / 23 for resistance.	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	• \	CHECK: Leak Detection Pump - V144- harness connector terminal 3 to the Engine Con-	•	REPAIR Faulty wiring or connector.
		trol Module - J623- harness connector T91 / 39 for resistance.	•	GO TO Step 5 <u>⇒ page 1145</u> .
50,	•	SPECIFIED VALUE: 0.5Ω (± 0.3Ω).		inthi.
OSTRAILO	_	Were Values obtained?		No.
5 %	11/40	Final Procedure Perform a road test to verify repair. Does the original DTC return? ON UP OF THE PROPERTY O	.	YES: CHECK: Engine Control Module - J623- har- ness connector for any damaged, pushed-out pins.
		Does the original DTC return?	•	REPAIR: As necessary.
			•	If all electrical connections are OK:
			•	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
			•	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
			•	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14.
			•	Return vehicle to Customer.
			→	NO: Perform the diagnostic procedure for any DTC's.
			•	If no DTC's return, the repair is complete.
			♦	Return vehicle to customer.

3.6.23 **Motronic Engine Control Module Power** Supply Relay - J271-, Checking

Sauthorised by Volkswagen AG. Volkswagen AG does not guarantee of

General Description

onnimercial purposes, in part or in whole, is p.

The following procedure is used to diagnose the Motronic Engine Control Module Power Supply Relay - J271- and the Engine Control Module - J623- power supply voltage that is provided by the Motronic Engine Control Module Power Supply Relay - J271- .

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step		Procedure		Result / Action to Take
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified?	_	YES: GO TO: Step 2 ⇒ page 1146 . NO: GATHER more information from customer about the complaint.
3	•	IGNITION: OFF. DISCONNECT: Motronic Engine Control Module Power Supply Relay - J271- from the Fuse Panel B - SB- in the engine compartment (refer to appropriate wiring diagram). IGNITION: ON. CHECK: Motronic Engine Control Module Power Supply Relay - J271- socket terminals 30 and 86 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Motron-	- ************************************	YES: GO TO: Step 3 ⇒ page 1146. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 1147. YES: GO TO: Step 4 ⇒ page 1147. NO:
	•	ic Engine Control Module Power Supply Relay - J271- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T91 / 5 and T91 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained?	•	GO TO: Step 5 <u>⇒ page 1147</u> .

Step	Procedure	Result / Action to Take
4	 DISCONNECT: Jumper wire, between the Motronic Engine Control Module Power Supply Relay - J271- socket terminals 30 and 870 AG of the Engine Control Module Power Supply Relay - J271- socket terminal 85 to the Engine Control Module - J623- harness connector T91 / 7 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	YES: ◆ REPLACE: Motronic Engine Control Module Power Supply Relay - J271 Refer to appro-
6	DISCONNECT: Jumper wire, between the Motronic Engine Control Module Power Supply Relay - J271- socket terminals 30 and 87. REMOVE: Appropriate fuse (refer to appropriate wiring diagram for correct fuse). CHECK: Downstream (output) side of appropriate fuse to the Engine Control Module - J623- harness connector T91 / 5 and T91 / 6 for resistance (refer to appropriate wiring diagram for correct fuse). SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? Final Procedure Perform a road test to verify repair. Does the original DTC return?	 REPLACE: Fuse panel. Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 1147. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 1147.

3.6.24 Outside Air Temperature Sensor -G17-, Checking

General Description

7- is a negms the semost outside air sas the tem-reases as the input along with imperature and sensor, performmay not engage.

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additional and the correctness of information of the correctness of the correctn The ambient or Outside Air Temperature Sensor - G17- is a negative temperature coefficient (NTC) sensor that informs the semiautomatic / automatic temperature control system of outside air temperature. An NTC sensor resistance decreases as the temperature increases, and the sensor resistance increases as the temperature decreases. The computer uses this input along with different in-car temperature sensors to control temperature and blower speed. When there is a problem with this sensor, performance will suffer and the A/C compressor clutch may not engage.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1148 NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Outside Air Temperature Sensor - G17- harness connector. CHECK: Outside Air Temperature Sensor - G17- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 1,300 Ω (+/- 500 Ω @ approx. 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 1149 . NO: REPLACE: Outside Air Temperature Sensor - G17 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 1149 .

01	Describer Assistants Take			
Step	Procedure	Result / Action to Take		
3	 REMOVE: Instrument Cluster Control Module - J285 Refer to appropriate repair manual. CHECK: Outside Air Temperature Sensor - G17- harness connector terminal 1 to the Instrument Cluster Control Module - J285- harness connector T32 / 20 for resistance. 	 YES: TIP: The Outside Air Temperature Sensor - G17- may fail under loaded operation; please swap a known good Outside Air Temperature Sensor - G17- prior to continuing to the next step. 		
	CHECK: Outside Air Temperature Sensor - G17- harness connector terminal 2 to the In- strument Cluster Control Module - J285- harness connector T32 / 19 for resistance.	 ◆ GO TO: Step 4 ⇒ page 1149 . NO: ◆ PERFORM: Visual Inspection of wiring and component. 		
	 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	♦ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.		
		 REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1149 . 		
4	Final ProcedurePerform a road test to verify repair.Does the original DTC return?	 YES: ◆ CHECK: Instrument Cluster Control Module - J285- harness connector for any damaged, pushed-out pins. ◆ REPAIR: As necessary. 		
	- A	♦♦/∘If allelectrical connections are OK:		
	workeed by Volkswager A	REPLACE: Instrument Cluster Control Module J285 Refer to appropriate repair manual.		
	Does the original DTC return? Does the original DTC return? Oxygen Sensor 1 After Catalytic C	 Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 → Erase DTC Memory", page 21. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14. Return vehicle to Customer. NO: 		
	in part o	Perform the diagnostic procedure for any DTC's.		
	's See'	♦ If no DTC's return, the repair is complete.		
	purpo	◆ Return vehicle to customer.		
3.6.25 Oxygen Sensor 1 After Catalytic Converter - GX7-, Checking				
Genera	I Description	altho		
3.6.25 Oxygen Sensor 1 After Catalytic Converter - GX7- Checking General Description The Oxygen Sensor 1 After Catalytic Converter - GX7- is positioned downstream of the primary catalytic converter and it supplies the Engine Control Module - J623- with a voltage signal (nonlinear) indicating a "rich" or a "lean" condition is present. If the primary catalytic converter is supersaturated with oxygen (indicating a lean mixture is present), the Oxygen Sensor 1 After Catalytic Converter - GX7- will send the Engine Control Module - J623- a nonlinear signal indicating the lean mixture condition. The mixture is then enriched with fuel until the oxygen has been "displaced" from the catalytic converter. This new condition, in turn,				

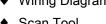
Oxygen Sensor 1 After Catalytic Con-3.6.25 verter - GX7-, Checking

General Description

The Oxygen Sensor 1 After Catalytic Converter - GX7- is positioned downstream of the primary catalytic converter and it supplies the Engine Control Module - J623- with a voltage signal (nonlinear) indicating a "rich" or a "lean" condition is present. If the primary catalytic converter is supersaturated with oxygen (indicating a lean mixture is present), the Oxygen Sensor 1 After Catalytic Converter - GX7- will send the Engine Control Module -J623- a nonlinear signal indicating the lean mixture condition. The mixture is then enriched with fuel until the oxygen has been "displaced" from the catalytic converter. This new condition, in turn, is registered by the Oxygen Sensor 1 After Catalytic Converter -GX7- as a nonlinear signal indicating the rich mixture condition. The mixture is then leaned out by the Engine Control Module -



_	 ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- component connector terminals 	 NO: GATHER more information from customer about the complaint. YES: GO TO Step 3 ⇒ page 1151 . NO: REPLACE: Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to appropriate repair manual.
Step 1	customers complaint. Refer to	Result / Action to Take - YES: ¹ / ₉ / ₂₀₁₂ → page 1150 → Vuebe Method No. 10 → Vueb
	ocedure	Too was a second
	v clean working conditions: .2 Clean Working Conditions", page 3.	ingo
Obs <u>⇒ "1</u>	erve all safety precautions: .1 Safety Precautions", page 2.	tioninit
posi	icles with manual transmission, ensure the shifter tion is in "N" with the parking brake applied.	inform _a
er p	osition is in "P".	lovos
	ch OFF all electrical and electronic accessories. icles with automatic transmission, ensure the selections.	ctor lev-
	ery voltage OK.	
	es OK.	
est re	quirements	Milest
Sca	n Tool.	
Wiri	ng Diagram.	12/18/6.
-	imeter.	TOCODIO.
ents c s a un	annot be serviced separately, and they must be s it. tools and workshop equipment required	ctor lev- Result / Action to Take - YES: 1998/2015
he Ox	ygen Sensor 1 After Catalytic Converter - GX7- c	ompo-
-	ter For Oxygen Sensor 1 After Catalytic Converter	· - 729
	owing components: gen Sensor After Three Way Catalytic Converter -	G130-
/erter - Γhe Ox	0400	
he gas Note th	is enriched or leaned out is variable, being dependent flow rate (engine load) at that moment. e Oxygen Sensor 1 After Catalytic Converter - GX7 as the Oxygen Sensor After Three Way Catalytic	7- is also
again b	If the nonlinear signal is received again, the mixtue enriched. The frequency, or period, during which	th the



Step		Procedure		Result / Action to Take
3	•	IGNITION: ON. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained?	- *	YES: GO TO Step 4 ⇒ page 1151. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO Step 6 ⇒ page 1152.
5	• • • • • • • • • • • • • • • • • • • •	RECONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CONNECT: Scan Tool. START: Engine and let Idle. Perform the function test located in diagnostic mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, ⇒ "3.3 Diagnostic Modes 01 – 0A", page 16. IGNITION: OFF. SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. For 2013 – 2016 Beetle, 2013 – 2014 Jetta: CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T91 / 91 for resistance. For 2015 – 2018 Jetta: CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector terminal 3 to the Engine Control Module - J623- harness connector T91 / 26 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T91 / 26 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 4 to the Engine Control Module - J623- harness connector T91 / 25 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	AG.	YES: FAULT: Is intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO Step 6 ⇒ page 1152. NO: GO TO Step 5 ⇒ page 1151. YES: REPLACE: Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to appropriate repair manual. GO TO Step 6 ⇒ page 1152. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO Step 6 ⇒ page 1152.
	_	Were Values obtained?		

Step	Procedure	Result / Action to Take	
6 •	Final Procedure Perform a road test to verify repair. Does the original DTC return?	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. 	
	Book and original Bird rotain.	♦ REPAIR: As necessary.	
		♦ If all electrical connections are OK:	
		 REPLACE: Engine Control Module - J623 Refer to appropriate repair manual not go and the DTC's. Refer to 3.3.4 Diagnostic Mode 04 - Erase DTC 	
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21	3c ₀₀ ,
	poses, in part or in whole, is not ben in legin	 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14 	Orany liability
	isho	♦ Return vehicle to Customer.	With
	or in whole	 NO: Perform the diagnostic procedure for any DTC's. 	espect to the
	part	♦ If no DTC's return, the repair is complete.	1e co
	in Ses, ir	♦ Return vehicle to customer.	rrectr
The Oxy not acturence be amount demand portation Catalytic voltage, Before Cused in concentradjusts to for excessions.	cial pur	o transologo de la low ensor 1 ers are oxygen , which pensate - J623-	ss of information in this objection.

Oxygen Sensor 1 Before Catalytic Con-3.6.26 verter - GX10-, Checking

General Description

The Oxygen Sensor 1 Before Catalytic Converter - GX10- does not actually measure oxygen concentration, but rather the difference between the amount of oxygen in the exhaust gas and the amount of oxygen in the air. A rich mixture causes an oxygen demand. This demand causes a voltage to build up, due to transformation of oxygen ions through the Oxygen Sensor 1 Before

Oxygen and Oxygen ions through the Oxygen Sensor 1 Before

Oxygen A lean mixture causes a low Catalytic Converter - GX10- layer. A lean mixture causes a low voltage, since there is an oxygen excess. The Oxygen Sensor 1 Before Catalytic Converter - GX10- and catalytic converters are used in order to reduce exhaust emissions. Information on oxygen concentration is sent to the Engine Control Module - J623-, which adjusts the amount of fuel injected into the engine to compensate for excess air or excess fuel. The Engine Control Module - J623attempts to maintain, on average, a certain air-fuel ratio by interpreting the information it gains from the Oxygen Sensor 1 Before Catalytic Converter - GX10- . The primary goal is a compromise between power, fuel economy, and emissions. The heater for the Oxygen Sensor 1 Before Catalytic Converter - GX10- is designed to minimize the time-to-readiness for closed-loop operation by heating the Oxygen Sensor 1 Before Catalytic Converter - GX10as quickly as possible.

Note the Oxygen Sensor 1 Before Catalytic Converter - GX10- is also known as the Heated Oxygen Sensor - G39-.

The Oxygen Sensor 1 Before Catalytic Converter - GX10- contains the following components:

- Heated Oxygen Sensor G39- .
- Oxygen Sensor Heater Z19- .



Special tools and workshop equipment required

- ♦ Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.



	in very Vo	Generic Scan Tool - Edition 12.2017
poner	Oxygen Sensor 1 Before Catalytic Converter - GX10 ats cannot be serviced separately, and they must be a unit.	0- com- e serv-
Speci	al tools and workshop equipment required	
♦ Mι	ultimeter.	
♦ Wi	ring Diagram.	M res
♦ Sc	an Tool.	pectt
Test r	equirements	othe
• Fu	ultimeter. ring Diagram. an Tool. equirements ses OK.	corre
 Ba 	ttery voltage OK.	octne
• Sw	vitch OFF all electrical and electronic accessories.	ssof
	hicles with automatic transmission, ensure the sele- position is in "P".	ctor lev-
po	hicles with manual transmission, ensure the shifter sition is in "N" with the parking brake applied.	lever The lever
	oserve all safety precautions: 1.1 Safety Precautions", page 2	i i i i i i i i i i i i i i i i i i i
	ew clean working conditions: '1.2 Clean Working Conditions", page 3 Procedure	A KAMPIMOS
Test F	Procedure	10/KSWSWS
		DAGE SALES
Step	Procedure	Result / Action to Take
Step 1	Procedure • PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. - Was Complaint verified?	Generic Scan Tool - Edition 12.2017 Combined Serv- Clever Result / Action to Take - YES: GO TO: Step 2 ⇒ page 1153. NO: GATHER more information from customer about the complaint.
1	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified?	 NO: ◆ GATHER more information from customer about the complaint.
	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF.	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153
1	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified?	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153 . NO:
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Cat- 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153 .
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector ter- 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153 . NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153 . NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual.
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C). 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153 . NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 1155 .
2	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C). Was Value obtained? 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153 . NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 1155 . YES: GO TO: Step 4 ⇒ page 1154 . NO: PERFORM: Visual Inspection of wiring and
2	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C). Was Value obtained? IGNITION: ON. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153. NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 1155. YES: GO TO: Step 4 ⇒ page 1154. NO: PERFORM: Visual Inspection of wiring and component.
2	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C). Was Value obtained? IGNITION: ON. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 4 to ground for voltage. 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153. NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 1155. YES: GO TO: Step 4 ⇒ page 1154. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corro-
2	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C). Was Value obtained? IGNITION: ON. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 4 to ground for voltage. IGNITION: OFF. 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153. NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 1155. YES: GO TO: Step 4 ⇒ page 1154. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
2	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C). Was Value obtained? IGNITION: ON. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 4 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. 	 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1153. NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 1155. YES: GO TO: Step 4 ⇒ page 1154. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corro-

Step		Procedure		Result / Action to Take
4	•	RECONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector.		YES: FAULT: Is intermittent.
		CONNECT: Scan Tool.		PERFORM: Visual Inspection of wiring and
		START: Engine and let Idle.		component.
	•	Perform the function test located in diagnostic mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Di-	S	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		agnostic Functions, ⇒ "3.3 Diagnostic Modes 01 – 0A", page 16.	♦ F	REPAIR: Faulty wiring or connector.
		IGNITION: OFF.	♦ (GO TO: Step 6 <u>⇒ page 1155</u> .
		SPECIFIED VALUE: Mode 6 Pass.		NO: GO TO: Step 5 <u>⇒ page 1154</u> .
	_	Were Values obtained?	, ,	50 10. 0.0p 0 <u> pago 110 1</u> .
5	•	DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. REMOVE: Engine Control Module - J623	♦ F	/ES: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair nanual.
		Refer to appropriate repair manual.		GO TO: Step 6 <u>⇒ page 1155</u> .
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 1 to the Engine Control Module - J623- harness connector T91 / 43 for resistance.	kswa	NO: ERFORM: Visual Inspection of wiring and
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 2 to the Engine Control Module - J623- harness connector T91 / 44 for resistance.	♦ ()	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 3 to the Engine Control Module - J623- harness connector T91 / 74 for resistance.	↑↑	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 1155
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter GX10- harness connector terminal 5 to the Engine Control Module - J623- harness connector T91 / 41 for resistance.		pect to the cor
		SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.		rectn
	_	Were Values obtained?		ess
		Were Values obtained?		DA NABON WOYNER ON THE WOOD IN

Step		Procedure		Result / Action to Take
6	•	Procedure Perform a road test to verify repair. Does the original DTC return? Does the original DTC return?	→ AG.	YES: CHECK: Engine Control Module - J623- har- ness connector for any damaged, pushed-out pins.
		Does the original DTC return?	♦	REPAIR: As necessary,
		as sautho	•	If all electrical connections are OK:
		in the state of th	•	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		Je, is not be,	*	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
		art or in who	•	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14 Return vehicle to Customer
		in pa	•	Return vehicle to Customer.
		purposes	→	NO: Perform the diagnostic procedure for any DTC's.
		ercial	•	If no DTC's return, the repair is complete.
		mmoo .	•	Return vehicle to customer.
3.6.2	3.6.27 Radiator Shutter Motor - V544- , Checking General Description The Radiator Shutter Motor - V544- is used to control the mass air flow entering the lower air inlet. By closing the Radiator Shutter Motor - V544- , the head wind towards the radiator and into the			
		ing The state of t		Cobundo
Gener	al I	Description iator Shutter Motor - V544- is used to control the		E CONSTILL MAINT
The Radiator Shutter Motor - V544- is used to control the mass air flow entering the lower air inlet. By closing the Radiator Shutter Motor - V544-, the head wind towards the radiator and into the engine compartment is reduced. This measure minimizes the				

Radiator Shutter Motor - V544-, Check-3.6.27 ing

General Description

The Radiator Shutter Motor - V544- is used to control the mass air flow entering the lower air inlet. By closing the Radiator Shutter Motor - V544-, the head wind towards the radiator and into the engine compartment is reduced. This measure minimizes the warm-up cycle and, in addition, decreases the air resistance at the vehicle's radiator grille, thus reducing the drag coefficient (cd). At the beginning of the warm-up cycle, the Radiator Shutter Motor - V544- is closed and remains closed until the engine coolant temperature has reached a defined threshold value (80 °C). As soon as this temperature threshold has been exceeded, the Radiator Shutter Motor - V544- is opened to provide the required cooling. If the engine coolant temperature falls below the temperature threshold again during the driving cycle (e.g. due to engine stop phases during start/stop operation), the Radiator Shutter Motor - V544- is closed again. Outside of the warm-up cycle, the Engine Control Module - J623- determines the set point position of the Radiator Shutter Motor - V544- using the vehicle speed and the cooling requirement of single partial functions (e.g. engine, air conditioning, charge air).

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.

- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1156 . NO: GATHER more information from customer about the complaint.
	V544- harness connector. IGNITION: ON. CHECK: Radiator Shutter Motor - V544- harness connector terminals 1 to 4 for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained?	 YESwagen A Go TO: Step 3 page 1156. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1157. YES:
	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Radiator Shutter Motor - V544- harness connector terminal 3 to the Engine Control Module - J623- harness connector T91 / 76 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 REPLACE: Radiator Shutter Motor - V544 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 1157. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1157.

Step	Procedure	Result / Action to Take
4	Final Procedure	- YES:
	 Perform a road test to verify repair. 	◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out
	– Does the original DTC return?	pins.
		♦ REPAIR: As necessary.
		♦ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	morised by Volkswagen AG. Volkswagen AG does,	◆ Clear the DTC's. Refer to ○ → "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
	ikedinkes auti	 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14
	88	Return vehicle to Customer.
, - 4/1	Volkswagen AG. Volkswagen AG does, volkswagen	 NO: ◆ Perform the diagnostic procedure for any DTC's.
Jriny		♦ If no DTC's return, the repair is complete.
npart (Return vehicle to customer.

. ump Relay ... y Air Injection Pump
... iu1-, Checking

In a secondary air injection system injects air into the exhaust using passages in the cylinder head. This extra air injection takes place using the Secondary Air Injection Pump Motor - V101- that is powered by the Secondary Air Injection Pump Relay - J299- on a cold-start of the engine for about 45 – 100 s and serves to quickly heat the catalytic converter(s) for improved emissions.

Special tools and workshop equipment required

Multimeter.

Wiring Diagram.

Scan Tool.
est requirem

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 1158 . NO: GATHER more information from customer
	- was complaint vermeu:	about the complaint.
2	IGNITION: OFF.	 YES: GO TO: Step 3 ⇒ page 1158.
	REMOVE: Secondary Air Injection Pump lay - J299- from fuse box. Refer to approp repair manual. IGNITION: ON	Re- riate AG NO: Swagen AG Office and PERFORM: Visual Inspection of wiring and
	• IGNITION: ON.	domponent:
	CHECK: Secondary Air Injection Pump Re- J299- harness connector terminal 1/86 a 3/30 to ground for voltage.	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	• IGNITION: OFF.	◆ REPAIR: Faulty wiring or connector.
	SPECIFIED VALUE: Battery voltage.	◆ GO TO: Step 6 <u>⇒ page 1159</u> .
	- Were Values obtained?	resp
3	CONNECT: Jumper wire, between the Se dary Air Injection Pump Relay - J299- soc terminals 3/30 and 5/87.	con- ket
	• IGNITION: ON:	◆ GO TO: Step 5 <u>⇒ page 1159</u> .
	SPECIFIED VALUE: The Secondary Air Intion Pump Motor V101- should be heard ning.	con- ket YES: GO TO: Step 4 ⇒ page 1158. NO: GO TO: Step 5 ⇒ page 1159.
	IGNITION: OFF.	mali
	- Was Value obtained?	
4	 DISCONNECT: Jumper wire, between the Secondary Air Injection Pump Relay - J29 socket terminals 3/30 and 5/87. 	
	REMOVE: Engine Control Module - J623- Refer to appropriate repair manual.	 GO TO: Step 6 ⇒ page 1159 . NO:
	CHECK: Secondary Air Injection Pump R - J299- harness connector terminal 2/85 to Engine Control Module - J623- harness co	elay PERFORM: Visual Inspection of wiring and component
	nector T105 / 60 for resistance.	 CHECK: Wiring for open, high resistance, short or harness connector for damage, corro-
	• SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	sion, loose or broken terminals.
	Was Value obtained?	♦ REPAIR: Faulty wiring or connector.
		◆ GO TO: Step 6 <u>⇒ page 1159</u> .

Step	Procedure	Result / Action to Take			
5	DISCONNECT: Jumper wire, between the Secondary Air Injection Pump Relay - J299- socket terminals 3/30 and 5/87. DISCONNECT: On the Air Line in Bulletin Bul	 YES: ◆ REPLACE: Secondary Air Injection Pump Motor - V101 Refer to appropriate repair manual 			
	DISCONNECT: Secondary Air Injection Pump Motor - V101- harness connector.	◆ GO TO: Step 6 <u>⇒ page 1159</u> .			
	CHECK: Secondary Air Injection Pump Motor V101- harness connector terminal 2 to the Secondary Air Injection Pump Relay - J299- socket terminal 5/87 for resistance.	 NO: ◆ PERFORM: Visual Inspection of wiring and component. 			
	CHECK: Secondary Air Injection Pump Motor - V101- harness connector terminal 1 to ground for resistance.				
	• SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	REPAIR: Faulty wiring or connector.			
	- Were Values obtained?	◆ GO TO: Step 6 <u>⇒ page 1159</u> .			
6	Final Procedure	- YES:			
	Perform a road test to verify repair.	◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out			
	- Bocs the original BTO returns	REPAIR: As necessary.			
		◆ If all electrical connections are OK:			
	Navyolkswagen AG. V	◆ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.			
	- Does the original DTC return? Does the original DTC return?	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21			
		 Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14 			
	si,	♦ Return vehicle to Customer.			
	orin whole.	 NO: Perform the diagnostic procedure for any DTC's. 			
	part	 If no DTC's return, the repair is complete. 			
	oses, in	♦ Return vehicle to customer.			
3.6.2	3.6.29 Secondary Air Injection Sensor 1 - G609- , Checking				
Gener	al Description	This go			
3.6.29 Secondary Air Injection Sensor 1 - G609- , Checking General Description The secondary air injection system injects air into the exhaust on a cold-start of the engine for 45-100 s and serves to quickly heat the catalytic converter(s) for improved emissions. A pressure based secondary air diagnostic function is used. In this system the signal from the Secondary Air Injection Sensor 1 - G609- is evaluated by the Engine Control Module - J623 The injected air quantity is determined from the pressure level. Special tools and workshop equipment required Multimeter.					
Specia	Special tools and workshop equipment required				
♦ Mu	◆ Multimeter.				
♦ Wiring Diagram.					

Secondary Air Injection Sensor 1 -3.6.29 G609-, Checking

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step	Procedure	Result / Action to Take
1 2	Procedure PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13. Was Complaint verified? IGNITION: OFF. DISCONNECT: Secondary Air Injection Sensor 1 - G609- harness connector. IGNITION: ON.	Result / Action to Take - YES: GO TO: Step 2 ⇒ page 1160. - NO: GATHER more information from customer about the complaint. - YES: GO TO: Step 3 ⇒ page 1160. - NO: GO TO: Step 4 ⇒ page 1161.
3	 CHECK: Secondary Air Injection Sensor 1 - G609- harness connector terminals 1 to 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: About 5.0 V. Was Value obtained? REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. CHECK: Secondary Air Injection Sensor 1 - G609- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 9 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: REPLACE: Secondary Air Injection Sensor 1 - G609 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1161 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1161 .
116	Rep. Gr.ST - Generic Scan Tool	DEWEMO WORTH THE THE WATER THE THE WATER THE THE WATER THE THE WATER THE

Step		Procedure		Result / Action to Take
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	- ♦	YES: GO TO: Step 5 ⇒ page 1161 .
	•	Refer to appropriate repair manual. CHECK: Secondary Air Injection Sensor 1 - G609- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 37 for resistance.	♥	component.
	•	CHECK: Secondary Air Injection Sensor 1 - G609- hamess connector terminal 3 to the Engine Control Module - J623- harness connector	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		T105 / 31 for resistance.		REPAIR: Faulty wiring or connector.
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	•	GO TO: Step 5 <u>⇒ page 1³161</u> .
	_	Were Values obtained?		Peg
5	•	Final Procedure	<u>-</u>	YES: CHECK: Engine Control Module - J623- har-
	•	Perform a road test to verify repair.		ness connector for any damaged, pushed-out pins.
	-	Does the original DTC return?		· Oth
		nurpo	X	REPAIR: As necessary.
		oial P		If all electrical connections are OK:
		muel	•	REPLACE: Engine Contro Module - J623 Refer to appropriate repair manual.
		o to a general to the second of the second o	*	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21
		Does the original DTC return?	7	Repair is complete. Generate Readiness Code. Refer to ○ ⇒ "3.2 Readiness Code", page 14.
		-ndo Nabella	5	Return vehicle to Customer.
		400JO19 .k	DA (INO.
			•	Perform the diagnostic procedure for any DTC's.
			•	If no DTC's return, the repair is complete.
			♦	Return vehicle to customer.

Secondary Air Injection Sensor 2 -3.6.30 G610-, Checking

General Description

The secondary air injection system injects air into the exhaust on a cold-start of the engine for $45-100\,\mathrm{s}$ and serves to quickly heat the catalytic converter(s) for improved emissions. A pressure based secondary air diagnostics function is used. In this system, the signal from the Secondary Air Injection Sensor 2 - G610- is evaluated by the Engine Control Module 2 - J624- . The injected air quantity is determined from the pressure level.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

Fuses OK.

- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step		Procedure		Result / Action to Take
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 . Was Complaint verified?	- •	YES: GO TO: Step 2 ⇒ page 1162. NO: GATHER more information from customer about the complaint.
2	•	IGNITION: OFF. DISCONNECT: Secondary Air Injection Sensor 2 - G610- harness connector. IGNITION: ON. CHECK: Secondary Air Injection Sensor 2 - G610- harness connector terminals 1 to 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: About 5.0 V. Was Value obtained?	**************************************	NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 1162 Step 2 Step 3 → page 1163 . NO: GO TO: Step 4 ⇒ page 1163 .
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Secondary Air Injection Sensor 2 - G610- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 9 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω) Was Value obtained?	- * - *	YES: REPLACE: Secondary Air Injection Sensor 2 - G610 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1163 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance short or harness connector for damage corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1163 . Page 1163 . REPAIR: Faulty wiring or connector.

	Г	Daniel / Anti-ma Anti-		
Step		Procedure		Result / Action to Take
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: GO TO: Step 5 <u>⇒ page 1163</u> .
	•	For Beetle, CHECK: Secondary Air Injection Sensor 2 - G610- harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 33 for resistance.	•	NO: PERFORM: Visual Inspection of wiring and component.
	•	For Jetta, CHECK: Secondary Air Injection Sensor 2 - G610- harness connector terminal		CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		1 to the Engine Control Module - J623- harness connector T105 / 35 for resistance.	*	REPAIR: Faulty wiring or connector.
	•	For Beetle, CHECK Secondary Air Injection Sensor 2 - G610- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 35 for resistance.		sion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1163. YES:
	•	For Jetta, CHECK: Secondary Air Injection Sensor 2 - G610- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 33 for resistance.		mationinthisc
	•	SPECIFIED VALUE: 0.5Ω (± 0.3Ω).		illingok
	_	Were Values obtained?		, in
5	•	Final Procedure Perform a road test to verify repair. Does the original DTC return?	7	YES:
	•	Perform a road test to verify repair.	2	CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out
	_	Does the original DTC return?	oi0"	pins. ĐANĐO
			•	REPAIR: As necessary.
			•	If all electrical connections are OK:
			•	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
			•	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21.
			•	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14.
			♦	Return vehicle to Customer.
			•	NO: Perform the diagnostic procedure for any DTC's.
			•	If no DTC's return, the repair is complete.
			*	Return vehicle to customer.

Secondary Air Injection Solenoid Valve 3.6.31 - N112-, Checking

General Description

The secondary air injection system injects air into the exhaust on a cold-start of the engine for about 45 – 100 s. and serves to quickly heat the catalytic converter(s) for improved emissions. A "pressure based secondary air diagnostics" function is used. In this system, the Engine Control Module - J623- controls the Secondary Air Injection Solenoid Valve - N112-, which allows the air quantity processary to be injected into the exhaust. quantity necessary to be injected into the exhaust.

Special tools and workshop equipment required

- ♦ Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- · Fuses OK.
- Battery voltage OK.
- · Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 3

Step	Procedure Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 Was Complaint verified? 	 YES: no. GO TO: Step 2 ⇒ page 1164 . NO: GATHER more information from customer about the complaint.
2	 IGNITION OFF. DISCONNECT: Secondary Air Injection Solenoid Valve - N112- harness connector. CHECK: Secondary Air Injection Solenoid Valve - N112- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 5 – 35 Ω (@ approx. 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 1464. NO: REPLACE: Secondary Air Injection Solenoid Valve - N112 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1165
3	 IGNITION: ON. CHECK: Secondary Air Injection Solenoid Valve - N112- harness connector terminal 1 to ground for voltage. SPECIFIED VALUE: Battery voltage. IGNITION: OFF. Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 1165. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 1165.

Step	Procedure		Result / Action to Take
4	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Secondary Air Injection Solenoid Valve - N112- harness connector terminal 2 to the Engine Control Module - J623- harness	Valve - please jection s	e Secondary Air Injection Solenoid N112- may fail under loaded operation swap a known good Secondary Air I Solenoid Valve - N112- prior to contir ne next step.
	connector T105 / 21 for resistance. • SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	GO TO	: Step 5 <u>⇒ page 1165</u> .
	- Was Value obtained?	NO: PERFC	DRM: Visual Inspection of wiring and nent.
		CHECK short or	K: Wiring for open, high resistance, rharness connector for damage, corose or broken terminals.
			R: Faulty wiring or connector.
		GO TO	: Step 5 <u>⇒ page 1165</u> .
5	Perform a road test to verify repair. Does the original DTC return? Beauthorized thy Nolkswagen AG. Volkswagen AG. does not guarante. Secundary Air System - GX24-, Ging Cal Description	YES: CHECK ness co pins.	K: Engine Control Module - J623- ha onnector for any damaged, pushed-
	agen AG. Volkswagen AG.	REPAIR	R: As necessary.
	adby Volkswage.	If all ele	ectrical connections are OK:
	55 authorities Wante	REPLA Refer to	CE: Engine Control Module - J623- o appropriate repair manual.
STATION OF THE PARTY OF THE PAR		Clear th ⇒ "3.3.4 Memory	ne DTC's. Refer to 4 <u>Diagnostic Mode 04 – Erase DTC</u> <u>y", page 21</u> .
2		Repair Code. F	is complete. Generate Readiness Refer to
		⇒ 3.2 r Return	Readiness Code", page 14 . vehicle to Customer.
		NO: Perform DTC's.	n the diagnostic procedure for any
		If no D7	ΓC [®] s return, the repair is complete.
		Return	venicle to customer.
			forma,
,		·Onlin	
3,6.3	Secondary Air System - GX24-, (eck-	
94016		Manus	
Gener	al Description	. ×_	

Secondary Air System - GX24-, Checking

General Description

The secondary air injection system sends air into the exhaust on a cold-start of the engine for about 45 – 100 sec. and serves to quickly heat the catalytic convertor(s) for improved emissions. A "pressure based secondary air diagnostics" function is used. In this system, the signal from Secondary Air Injection Secondary 4. this system, the signal from Secondary Air Injection Sensor 1 - G609- is evaluated in the Engine Control Module - J623- . The injected air quantity is determined from the pressure level.

The Secondary Air System - GX24- contains the following components:

Secondary Air Injection Solenoid Valve - N112- .

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions ⇒ "1.2 Clean Working Conditions", page 3.

♦ Se	ecor	ndary Air Injection Sensor 1 - G609					
The Secondary Air System - GX24- components cannot be serviced separately, and they must be serviced as a unit.							
Special tools and workshop equipment required							
◆ Multimeter.							
♦ W	iring	g Diagram.					
♦ Sc	can	Tool.					
Test	requ	uirements	wswagen AG. Volkswagen AG does				
• Fı	ıses	OK.	one guaran				
• Ba	atter	ry voltage OK.	"Tee or				
• S1	vitch	n OFF all electrical and electronic accessories.	· CC By				
		les with automatic transmission ensure the selection is in "P".	ctor lev-				
• Ve	ehicl sitio	les with manual transmission, ensure the shifter on is in "N" with the parking brake applied.	Plever				
• Ol <u>⇒</u>	oser <u>"1.1</u>	rve all safety precautions: Safety Precautions", page 2	pect to th				
\Rightarrow	<u>"1.2</u>	clean working conditions , page 3.	ctor lev- Result / Action to Take				
Test	Prod	cedure	thess				
Step	<u> </u>	Procedure	Result / Action to Take				
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 . Was Complaint verified?	 YES: GO TO: Step 2 ⇒ page 1166 . NO: GATHER more information from customer about the complaint. 				
2	1.	IGNITION: OFF.	- YES:				
	.	DISCONNECT: Secondary Air System GX24- harness connector.	♦ GO TO: Step 3 page 1166.				
			– NO: ♣ REPLACE: Secondary Air System - GX24				
	•	CHECK: Secondary Air System - GX24- component connector terminals 1 to 5 for resist-	Refer to appropriate repair manual.				
		ance.	♦ GO TO: Step 7 <u>⇒ page 1168</u> .				
	•	SPECIFIED VALUE: 5 – 35 Ω (at approx. 20° C).					
	1-	Was Value obtained?					
3	•	IGNITION: ON.	 YES: GO TO: Step 4 ⇒ page 1167. 				
	•	CHECK: Secondary Air System - GX24- harness connector terminal 1 to ground for volt-	- NO:				
		age.	◆ PERFORM: Visual Inspection of wiring and				
		•	◆ PERFORM: Visual Inspection of wiring and component.				
		age.	 PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, 				
		age. IGNITION: OFF.	◆ PERFORM: Visual Inspection of wiring and component.				
		age. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corro- 				

Step	Procedure	Result / Action to Take
4	IGNITION: ON.	- YES:
	CHECK: Secondary Air System - GX24- har- ness connector terminals 2 to 4 for voltage.	 ◆ GO TO: Step 5 ⇒ page 1167. – NO:
	IGNITION: OFF.	◆ GO TO: Step 6 <u>⇒ page 1167</u> .
	SPECIFIED VALUE: About 5.0 V.	
	– Was Value obtained?	
6	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Secondary Air System - GX24- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 9 for resistance. CHECK: Secondary Air System - GX24- harness connector terminal 5 to the Engine Control Module - J623- harness connector T105 / 21 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? CHECK: Secondary Air System - GX24- harness connector terminal 2 to the Engine Connector terminal 2 to the Engine Con- 	 YES: REPLACE: Secondary Air System - GX24 Refer to appropriate repair manual. GO TO: Step 7 ⇒ page 1168. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 7 ⇒ page 1168. YES: TIP: The Secondary Air System - GX24- may
	 trol Module - J623- harness connector T105 / 35 for resistance. CHECK: Secondary Air System - GX24- harness connector terminal 4 to the Engine Control Module - J623- harness connector T105 / 33 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 fail under loaded operation; please swap a known good Secondary Air System - GX24-prior to continuing to the next step. ◆ GO TO: Step 7 ⇒ page 1168 . - NO: ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector.
	Protected by Copyrighty Copyright	• GO TO: Step 7 ⇒ page 1168. The poor to the correctness of information of info
		3. Diagnosis and Testing 116

Step		Procedure		Result / Action to Take			
7	• -	Perform a road test to verify repair. Does the original DTC return?	-	YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. NAME PAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623- Refer to appropriate repair manual. Clear the DTC's. Refer to 3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21. Repair is complete. Generate Readiness Code. Refer to 3.2 Readiness Code", page 14. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete.			
		omme	♦	Return vehicle to customer.	matio		
Refer to appropriate repair manual. Clear the DTC's. Refer to a "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21. Repair is complete. Generate Readiness Code. Refer to a "3.2 Readiness Code", page 14. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer. 3.6.33 Three Way Catalytic Converter, TWC Checking General Description A catalytic converter is a vehicle emissions control device that Converted to Customer. Output Description A catalytic converter is a vehicle emissions control device that Converted the Converted to Customer. Output Description A catalytic converter is a vehicle emissions control device that Converted the Converted that Conve							

Three Way Catalytic Converter, TWC 3.6.33 Checking

General Description

General recommendations

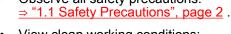
Oxygen sensors OK.

No leaks or damage to exhaust system.

Prior to repair work, perform a preliminary check to verify the condition. Refer to ⇒ "3.1 Preliminary Check", page 13.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.



Test Procedure

Step	Procedure	Result / Action to Take		
1	Activate Monitors: • Perform the function test in Diagnostic Mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, ⇒ "3.3 Diagnostic Modes 01 – 0A", page 16.	 Check the exhaust system for leaks. If necessary, repair the leak(s) in the exhaust system. GO TO: Step 2 ⇒ page 1169. 		
	 End diagnosis and switch the ignition off. If the specified values are exceeded: 	aby Volkswagen AG. Volkswagen AG does not guara.		
2	O2 Sensor Monitoring: • Erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21 • Perform a road test to verify repair. • If the DTC does not return:	 ◆ Generate readiness code. Refer to ⇒ "3.2 Readiness Code", page 14. ◆ If no leaks are found in the exhaust system: ◆ Replace the catalytic converter with front exhaust pipe. Refer to appropriate repair manual. ◆ GO TO: Step 3 ⇒ page 1169. 		
3	Final procedure: Perform a road test to verify repair. Multiplication of the procedure of the proc	 After the repair work, the following work steps must be performed in the following sequence: Check the DTC memory. Refer to ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20 . If necessary, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21 . If the DTC memory was erased, generate readiness code. Refer to ⇒ "3.2 Readiness Code", page 14 . Return vehicle to Customer. 		
3.6.34 Throttle Valve Control Module - GX3 Checking Concret Description				

Throttle Valve Control Module - GX3, 3.6.34 Checking

General Description

Throttle valve operation occurs by an electric motor identified as the EPC Throttle Drive - G186- located within the Throttle Valve Control Module - GX3- . It is controlled by the Engine Control Module - J623- with primary inputs from the Accelerator Pedal Module - GX2- as well as other peripheral inputs from the EPC Throttle Drive Angle Sensor 1 - G187- and the EPC Throttle Drive Angle Sensor 2 - G188- .

The Throttle Valve Control Module - GX3 / J338- contains the following components:

- ◆ EPC Throttle Drive G186-
- ◆ EPC Throttle Drive Angle Sensor 1 G187-
- ◆ EPC Throttle Drive Angle Sensor 2 G188-

The Throttle Valve Control Module - GX3 / J338- components cannot be serviced separately, and they must be serviced as a

Special tools and workshop equipment required

Multimeter.

- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- · Battery voltage OK.
- · Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 3

Step		Procedure		Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13.	-	YES: GO TO: Step 2 ⇒ page 1170 . NO:
	_	Was Complaint verified?	*	GATHER more information from customer about the complaint.
2	•	IGNITION: OFF.	_	YES: CONDITION: May be intermittent.
	•	CONNECT: Scan Tool.		•
	•	IGNITION: ON.	JIKS'	PERFORM: Wisual Inspection of wiring and Component.
	•	CHECK: Throttle valve position closed:	♦	CHECK: Wiring for open, high resistance,
	•	SPECIFIED VALUE: 3 – 25%.		short or harness connector for damage, corrosion, loose or broken terminals.
	•	DEPRESS: Accelerator pedal slowly to WOT while observing the percentage display. The	•	REPAIR: Faulty wiring or connector.
		percentage display must increase uniformly.	•	GO TO: Step 6 ⇒ page 1171. NO: GO TO: Step 3 ⇒ page 1170.
	•	CHECK: Throttle valve position at WOT:	_	NO:
	•	SPECIFIED VALUE: 84 97%.	*	GO TO: Step 3 <u>⇒ page 1170</u> .
	•	IGNITION: OFF.		
	_	Were Values obtained		
3	•	REMOVE: Throttle Valve Control Module - GX3-far enough so that the harness connector terminals are accessible.	-	YES: GO TO: Step 4 ⇒ page 1171 . NO:
	•	DISCONNECT: Throttle Valve Control Module - GX3- harness connector.	•	GO TO: Step 5 <u>⇒ page 1171</u> .
		IGNITION: ON.		That,
	•	CHECK: Throttle Valve Control Module - GX3-harness connector terminals 2 to 6 for voltage.		DA 10 BE WAIN DIN WAIN DIN WAY OU IN THE THE WAY OF THE WAY O
	•	IGNITION: OFF.		intoga
	•	SPECIFIED VALUE: About 5.0 V.		No. The
		Was Value obtained? كالم		THE HELD
		IGNITION: OFF. SPECIFIED VALUE: About 5.0 V. Was Value obtained?	7 pə;	108101 Magswaylo Vya.
				-4rad .DA no.

Ston	Procedure Result / Action to Take				
Step					
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Throttle Valve Control Module - GX3-harness connector terminal 1 to the Engine Control Module - J623- harness connector T105 / 34 for resistance. 	◆ GO TO: Step 6 <u>⇒ page 1171</u> . – NO:			
	CHECK: Throttle Valve Control Module - GX3- harness connector terminal 3 to the Engine Control Module - J623- harness connector T105 / 91 for resistance.				
	CHECK: Throttle Valve Control Module - GX3- harness connector terminal 4 to the Engine Control Module - J623- harness connector T105 / 55 for resistance.	 REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 1171. 			
	CHECK: Throttle Valve Control Module - GX3- harness connector terminal 5 to the Engine Control Module - J623- harness connector T105 / 90 for resistance.				
	• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	agen AG. Volkswagen AG does not			
	- Were Values obtained?	_{agen} AG. Volkswagen AG does not gua _{fanta}			
5	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	- YES: ♦ GO TO: Step 6 ⇒ page 1171.			
	CHECK: Throttle Valve Control Module - GX3- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 54 for resistance.	PERFORM: Visual Inspection of wiring and component.			
	CHECK: Throttle Valve Control Module - GX3- harness connector terminal 6 to the Engine Control Module - J623- harness connector T405 / 50 forms id-623-	1			
	T105 / 56 for resistance. • SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	 REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 1171 . 			
	Were Values obtained?	ectn			
6	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	→ YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.			
	To the state of th	♦ REPAIR: As necessary.			
	ald the second	♦ If all electrical connections are OK:			
	**************************************	♦ REPLACE: Engine Control Module J623 Refer to appropriate repair manual.			
	Cled by COpyright. Co.	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 21			
		 REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Modules J623-Refer to appropriate repair manual. Clear the DTC's. Refer to 3.3.4 Diamostic Mode 04 - Erase DTC Memory", page 21 Repair is complete. Generate Readiness Code. Refer to 3.2 Readiness Code", page 14 Return vehicle to Customer. NO: Perform the diagnostic procedure for any 			
		Return vehicle to Customer.			
		NO:◆ Perform the diagnostic procedure for any DTC's.			
		◆ If no DTC's return, the repair is complete.			
		Return vehicle to customer.			

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Turbocharger Recirculation Valve -3.6.35 N249-, Checking

General Description

A Turbocharger Recirculation Valve - N249- keeps a portion of air running through the intake side of the turbocharger when the throttle valve is closed and boost pressure is still present. This keeps the turbocharger impeller from slowing down, reducing turbo lag when the throttle is applied again.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 3.

Step		Procedure		Result / Action to Take
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 13 . Was Complaint verified?	- •	YES: GO TO: Step 2 ⇒ page 1172 . NO: GATHER more information from customer about the complaint.
2		IGNITION: OFF. DISCONNECT: Turbocharger Recirculation Valve - N249- harness connector. CHECK: Turbocharger Recirculation Valve - N249- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 3 – 15 Ω (@ approx. 20° C).	- + - +	YES: GO TO: Step 3 ⇒ page 1173. NO: REPLACE: Turbocharger Recirculation Valve - N249 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 1173.
	-	Was Value obtained?		





Step	Procedure	Result / Action to Take
3	 IGNITION: ON. CHECK: Turbocharger Recirculation Valve - N249- harness connector terminal 1 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	 YES: GO TO: Step 4 page 1173. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 page 1173.
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Turbocharger Recirculation Valve - N249- harness connector terminal 2 to the Engine Control Module - J623- harness connector T105 / 66 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623- Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 21. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 14. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

3.6.36 Vehicle Speed Signal, Checking

General Description

The Vehicle Speed Signal or VSS measures Transmission / Transaxle output or Wheel Speed from the ABS. The signal is broadcasted over the CAN Bus. The Engine Control Module -J623- uses this information to modify engine functions such as ignition timing, A/F ratio, transmission shift points, and to initiate diagnostic routines.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.

- Switch OFF all electrical and electr

Step	Procedure	Result / Action to Take
1	PERFORM: Preliminary Check to verify the customers complaint. Refer to \$\infty\$ "3.1 Preliminary Check", page 13. Was Complaint verified?	 YES: GO TO: Step 2 ⇒ page 1174. NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. CONNECT: Scan Tool. ROAD TEST: Vehicle. CHECK: Scan Tool to Speedometer for accuracy. SPECIFIED VALUE: Difference ≤ 10%. Was Value obtained? 	 YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 1175. NO: GO TO: Step 3 ⇒ page 1175.

Step	Procedure	Result / Action to Take
3	CHECK: ABS. CHECK: ABS DTC's: Nagen AG. Volkswagen AG does Was the ABS OK?	▼ GO 10 Step 4 <u>⇒ page 1175</u> .
	- Was the Apps OK!	 NO: REPAIR: Any ABS concerns 1st. GO TO: Step 4 page 1175 .
Or in 14.1	Final Procedure Perform a road test to verify repair. Do any DTC's return:	 YES: Check the DTC memory. Refer to ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 20
nurposes, in part		 Perform the diagnostic procedure for that DTC. NO: Repair is complete. Generate readiness code. Refer to ⇒ "3.2 Readiness Code", page 14
-	<u>t</u>	Return vehicle to Gustomer.
DAB 1	2-18-17 OC Juna Oo Aqpeloelor O O Negative SA negative	^{MOV} Washing

Cautions & Warnings

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Volkswagen retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the VAG 551 Scan Tool (ST).
- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it.
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear
 goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.
- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used
 only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts,
 washers, circlips and cotter pins. Always follow the recommendations in this manual replace these fasteners with
 new parts where indicated, and any other time it is deemed necessary by inspection.

Cautions & Warnings

- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.
- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.
- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.

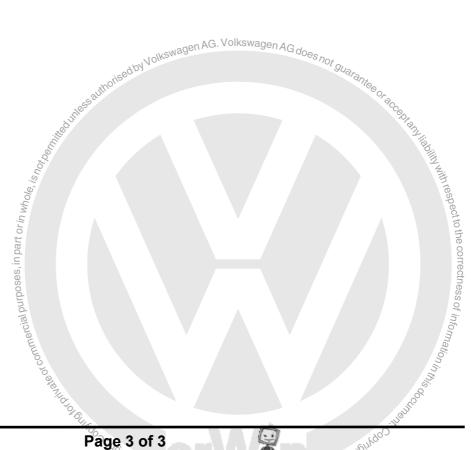
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Cautions & Warnings

- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the VAG 1551 Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

I have read and I understand these Cautions and Warnings.



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